Power management

PowerLogic System

Catalogue

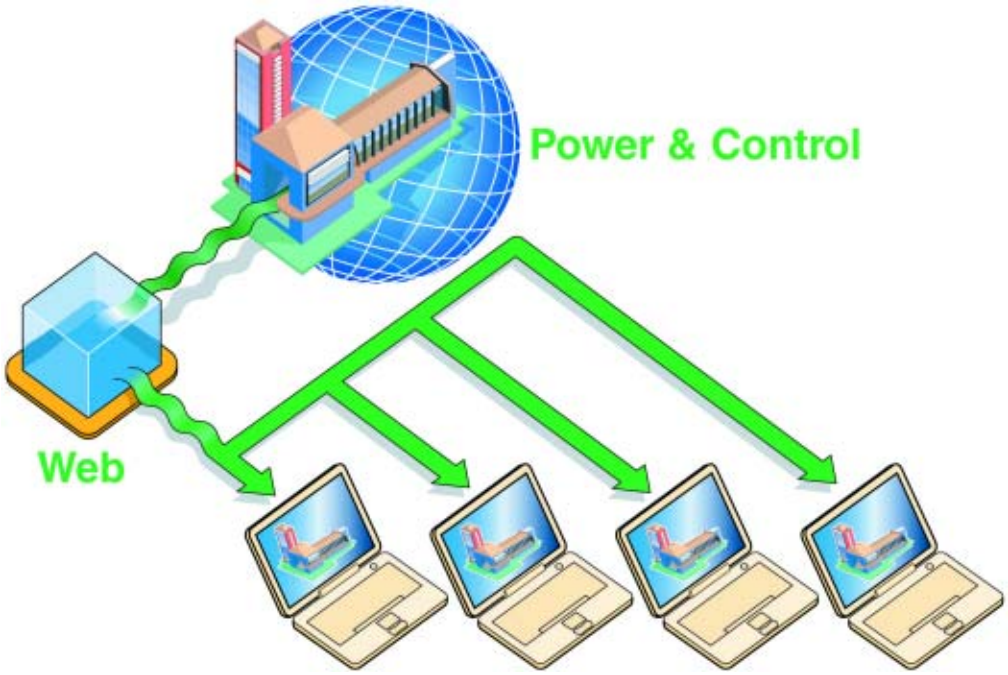
2004

a brand of Schneider Electric

Merlin Gerin

PowerLogic System is…

Transparent Ready®



*PowerLogic System helps you control the **cost, quality and reliability** of electric power.*

With PowerLogic System, you can determine where extra capacity exists, identify over-loaded equipment and balance loads on substations, switchboards and other power equipment. By optimising your electrical system, you extend the life of your installation.

Introduced more than ten years ago, PowerLogic System has proven its cost-effectiveness and continues to help customers improve their productivity and profitability every day.

PowerLogic System is Transparent Ready™, making full use of web-enabled technology. In this way, our commercial and industrial power distribution expertise spans from single buildings to geographically dispersed enterprise systems.

With PowerLogic System, Schneider Electric gives you the best of the New Electric World, where and when you need it.

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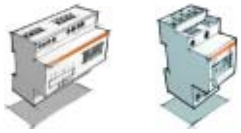

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Why use PowerLogic System?

Get all the information you need to manage your electrical installation

Today, cost management and improved continuity of service can boost your competitiveness. For this, you need more information concerning the operation of your electrical installation: consumption data, load curves, disturbances, harmonic pollution, available power, etc.

PowerLogic System brings you all this information. Information you can count on, where and when you need it.

E88678

Public buildings

87321_A

Hospitals

09095

Semiconductor manufacturers

029693_A

Automobile industry

PowerLogic System, the metering and monitoring solution suited to the widest variety of applications.

PowerLogic System, the metering and monitoring solution

PowerLogic System offers a complete, consistent power metering and monitoring solution for optimal management of your electrical installation.

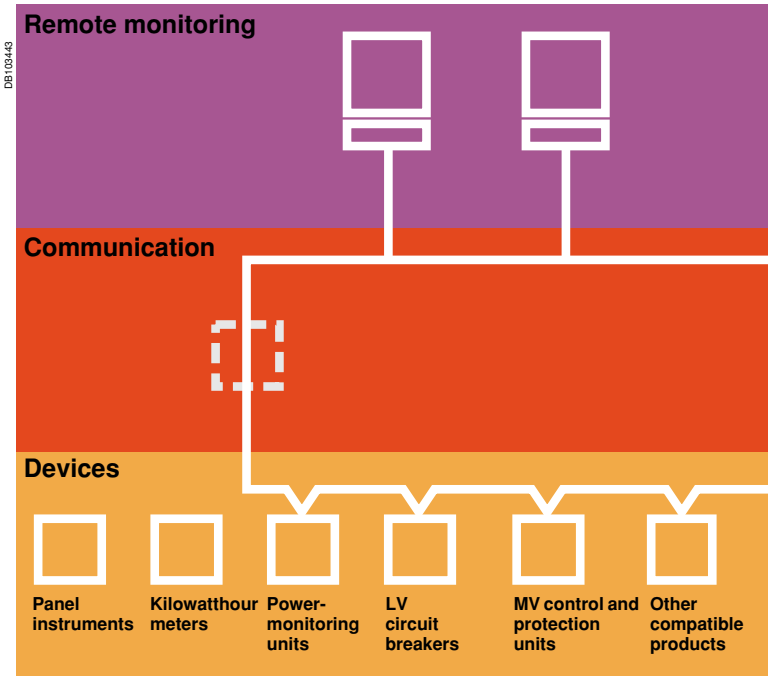
A complete solution:

- covering all electrical installation management needs, from simple current metering right through to remote monitoring of power quality
- backed by the most complete range of metering/monitoring devices and power-monitoring software on the market
- suited to the widest variety of applications in both industrial and service sectors.

A consistent solution:

- integrating all low and medium voltage metering, monitoring and protection devices
- offering communication software and gateways pre-configured for easy integration of Schneider Electric devices
- at the heart of the **Transparent Ready™** concept.

DB103443



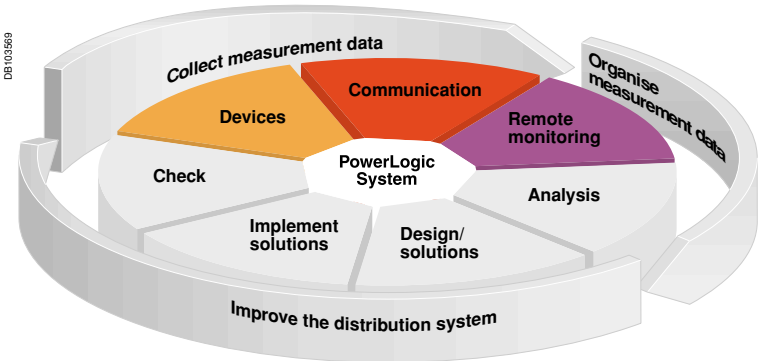
A PowerLogic System solution integrates

- PowerLogic range products:
  - metering and monitoring devices, both communicating and non-communicating
  - communication interfaces
  - power-monitoring software
- Masterpact and Compact circuit breakers equipped with Micrologic control units
- Sepam and Vigirex protection relays
- any other Modbus-comptabile device

Why use PowerLogic System?
(cont.)

PowerLogic System, the key to improving your electrical distribution system

PowerLogic System serves 3 functions:
- collection of measurement data
- organisation and transmission of measurement data to facilitate analysis by the different departments concerned: production, maintenance, accounting, site management
- checking of the results obtained after implementing electrical distribution system improvement solutions.

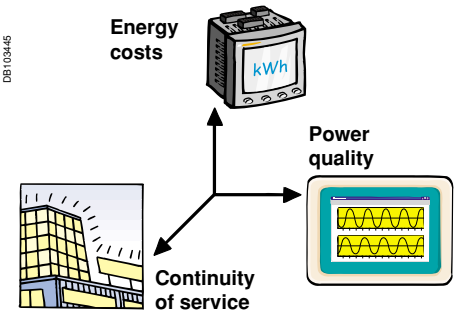


With PowerLogic System, you control your electrical installation

PowerLogic System helps you

Reduce energy costs

get a clearer view of your consumption
- identification of major consumers and allocation of costs
- management of consumption peaks and optimisation of your utility contract.



Improve power quality

increase power-system reliability and optimise your operating costs
- monitoring of harmonics
- lower maintenance costs
- reduced production losses.

Improve continuity of service

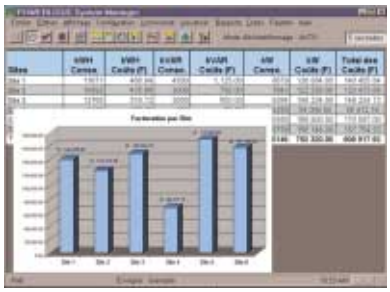
use the full capacity or your installation
- analysis of the electrical distribution system
- diagnosis of failures.

Why use PowerLogic System?
Benefits and applications

Reduce energy costs

DB103446

PowerLogic System helps you reduce power consumption and the cost of the energy you use through sub-billing and electrical contract optimisation.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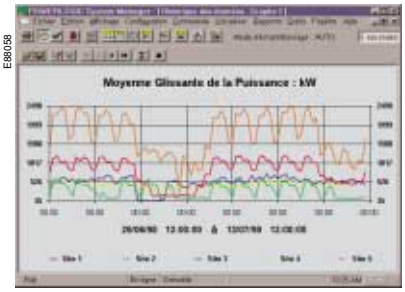
Organisation of measurement data



E88059

Trend curves

Sub-billing and cost allocation to reduce consumption

Metering of energy consumption to:
- identify major consumers
- allocate costs
- make users aware of expenditures.

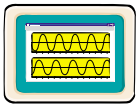
Optimisation of power contract and load curves to reduce energy costs

Recording of energy consumption and load curves to:
- optimise the power contract
- aggregate multi-site costs and negotiate global contracts
- identify spare capacity for electrical installation extensions
- manage peaks and avoid penalties:
  - improve power factor by power factor correction solutions
  - avoid subscribed-power overruns by automatic load-shedding.

Monitoring of other utilities

Count pulses received from other utility meters (water, gas, steam, etc.) for global, centralised utility management.

Improve power quality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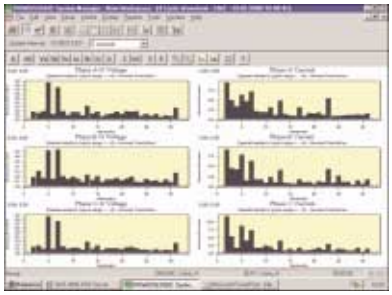
Power quality has a direct impact on operating costs:
- direct costs: over-consumption due to increased power losses
- indirect costs:
  - production losses: process malfunctions, unnecessary tripping
  - equipment costs: shorter service life, lower efficiency, oversized equipment.


E87257

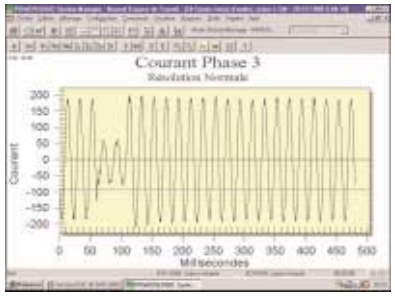
Spectral analysis of harmonics

PowerLogic System lets you assess the quality of your power, identify the causes of any problems and check the effectiveness of remedial measures.

Four main functions are used to check power quality:
- monitoring of harmonics
- detection of voltage sags and swells
- detection of transients
- EN50160 electricity supply compliance checking.

Why use PowerLogic System?
Benefits and applications (cont.)

E87258



Waveform capture triggered by a disturbance

Measurement of total harmonic distortion and individual harmonic content
- identify sources of harmonic distortion and separate them from sensitive loads
- determine causes of malfunctions
- derate power devices (transformers, cables, etc.)
- implement filtering solutions.

Detection and waveform capture of voltage sags and swells
Determine the origin of production losses or shutdowns.

Detection and waveform capture of transients
Determine the causes of malfunctions and breakdowns.

EN50160 electricity supply compliance checking
To assess the quality of distributed power according to the European standard EN50160 and check that the distributor complies with the standard.

Improve continuity of service

DB103347

Electricity is vital to site operation.
However, the phenomena that cause faults are not always easy to understand.
PowerLogic System gives a better understanding of the electrical distribution system and offers tools for analysis. It lets you manage the system in real time and thereby increase reliability.

PE100624

Real time monitoring of your electrical installation

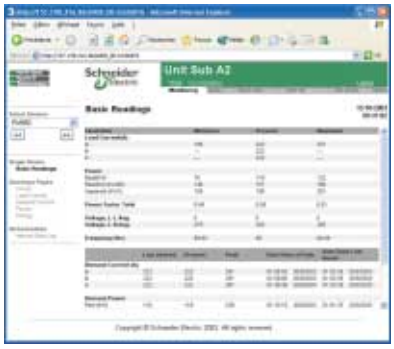
Panel instrumentation
For local display of measurement data and checks on installation operation.

Remote monitoring
Monitoring of the electrical installation to get the right information to the right person at the right time:
- switchgear status and measurements for the facility manager
- alarms and events for the maintenance department
- cost allocation for the accounting department, etc.

Open, flexible communication system allowing intervention by an external expert when required.

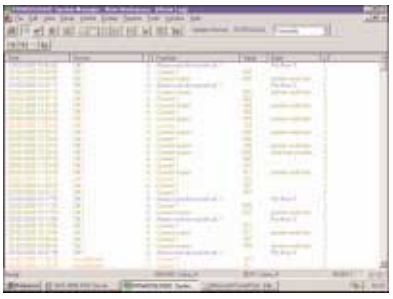
Transparent access to information via Web technologies
With the EGX400 Web server, you can now access all the information you need wherever you are and whenever you want via a standard browser like Internet Explorer©.

PE100554



Access to metering and monitoring data via a Web browser

E87264



Event and alarm logs

Preventive and corrective maintenance

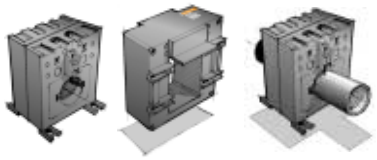
Preventive maintenance
Detection of problems in advance based on key parameters, to avoid equipment failures and downtime.

Corrective maintenance
Clear, complete information for the facility manager regarding fault circumstances in order to get power restored as quickly as possible:
- local or remote alarms (e.g. by telephone or pager)
- fault locating, overall vision, summary tables, etc.

Detailed information for experts in charge of analysing the causes of faults and designing solutions to improve the electrical distribution system:
- event and alarm logs
- waveform capture, etc.

Panorama of the PowerLogic range

Current transformers



TI
current transformer

Installation

- cable connections
- insulated cable, diameter 21 to 35 mm, through transformer
- busbar through transformer:
  - Prisma vertical busbars, 20 x 5 and 32 x 5 mm
  - insulated flexible busbars, 30 x 10 to 65 x 32 mm
  - Linergy busbars, 800 A and 1600 A
  - rigid busbars, 20 x 5 to 55 x 165 mm

Characteristics

- transformation ratio: 40/5 A to 6000/5 A
- accuracy: class 0.5 to 3
- maximum rated operational voltage: 720 V AC
- standard or tropicalised

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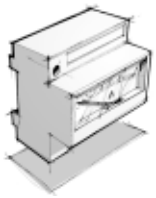
Panel instruments



Name	AMP / VLT	AMP / VLT
Function	ammeter, voltmeter	ammeter, voltmeter
Technology	analog	digital
Installation	DIN rail 4 x 18 mm modules	DIN rail 2 x 18 mm modules

Applications

Installation monitoring		
Panel instrumentation	I / U	I / U
Remote monitoring		
Advanced remote monitoring		

Sub-billing and cost allocation		
Energy consumption		
Consumption for different time periods		
Consumption of other utilities		
Optimisation of power contract and load curves		

Power quality analysis		
Monitoring of harmonics (THD)		
Analysis of individual harmonic content		
Detection of voltage sags and swells		
Detection of transients		
EN50160 compliance checking		

Characteristics

Measurement accuracy	class 1.5	± 0.5% ± 1 digit
Voltage measurement	VLT: 500 V AC direct or external VT	VLT: 600 V AC direct or external VT
Current measurement	AMP: 30 A direct or external CT	AMP: 10 A direct or external CT
Communication ports		
Inputs / Outputs		
Memory capacity		

page XXX

page XXX

Panorama of the PowerLogic range (cont.)

Kilowatthour meters

	AMP / VLT	IM100 / UM100	FRE	CH / CI	CE	ME
	ammeter, voltmeter	ammeter, voltmeter	frequency meter	hour counter pulse counter	kilowatthour meter	watthour meter
	analog	digital	digital	electromechanical	electromechanical	digital
	flush mount 72 x 72 mm 96 x 96 mm	flush mount 72 x 72 mm	DIN rail 2 x 18 mm modules	CI, CH: DIN rail 2 x 18 mm modules CH: flush mount	DIN rail 6 x 18 mm modules	DIN rail 2 or 4 x 18 mm modules
	I / U	I / U	F	hours / pulses	E	E
	class 1.5	± 1% ± 1 digit	± 0.5% ± 1 digit		class 2	class 2
	VLT: 500 V AC direct or external VT	UM100: 600 V AC direct or external VT	400 V AC direct		400 V AC direct	400 V AC direct
	AMP: external CT	IM100: external CT			63 A direct or external CT	63 A direct or external CT
	page XXX	page XXX	page XXX	page XXX	page XXX	page XXX

Panorama of the PowerLogic range (cont.)

Power-monitoring units

Name	**PM9P / PM9C**	**PM500**	**PM700 / PM710**	**PM810**	**PM820 / PM850**
Function	Power Meter	Power Meter	Power Meter	Power Meter	Power Meter
Technology	digital	digital	digital	digital	digital
Installation	DIN rail 4 x 18 mm modules	flush mount 96 x 96 mm	flush mount 96 x 96 mm	flush mount 96 x 96 mm	flush mount 96 x 96 mm

Applications

Installation monitoring

Panel instrumentation	**I, U, F, P, Q, S, PF, E (demand, minimum and maximum values)**				
Remote monitoring					
Advanced remote monitoring				**time-stamped alarms**	**time-stamped alarms…**

Sub-billing and cost allocation

Energy consumption					
Consumption for different time periods					
Consumption of other utilities					
Optimisation of power contract and load curves					

Power quality analysis

Monitoring of harmonics (THD)					
Analysis of individual harmonic content					
Detection of voltage sags and swells					
Detection of transients					
EN50160 compliance checking					

Characteristics

Measurement accuracy	class 2 (active energy)	class 1 (active energy)	class 1 (active energy)	class 1 (active energy)	class 0.5S (active energy)
Voltage measurement	450 V AC direct or external VT	480 V AC direct or external VT	480 V AC direct or external VT	600 V AC direct or external VT	600 V AC direct or external VT
Current measurement	external CT	external CT	external CT	external CT	external CT
Communication ports	1	1	1	1	1
Inputs / Outputs	1 O	8 I/O	2 O	16 I/O	16 I/O
Memory capacity					80 / 800 kbytes

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Panorama of the PowerLogic range (cont.)

Communication and supervision

	CM3000	CM4000
	Circuit Monitor	Circuit Monitor
	digital	digital
	display in front, module inside switchboard	display in front, module inside switchboard
…and data logs		
	class 0.5S (active energy)	class 0.2S (active energy)
	600 V AC direct or external VT	600 V AC direct or external VT
	external CT	external CT
	4	5
	9 I/O	25 I/O
	8 Mbytes	32 Mbytes
	page XXX	**page XXX**

Name	EGX200	EGX400	MPS100	SMS
Function	Ethernet gateway	Ethernet server	Ethernet server	power-monitoring software
Installation	DIN rail or desktop	DIN rail or desktop	DIN rail or desktop	
Applications				
Ethernet communication				
RS 485 / Ethernet gateway				
Web server with standard HTML pages		**Micrologic, PM9C, PM500, PM710, PM800, Sepam CM3000, CM4000**	**Micrologic, PM500, PM800**	**Micrologic, PM9C, PM500, PM710, PM800, Sepam CM3000, CM4000**
Web server with custom HTML pages				
Remote monitoring				
Real time data				
Historical data				
Automatic notification				
Alarm and event logs				
Waveform display				
Custom animated graphics				
Automatic creation of custom reports				
Characteristics				
Ethernet ports Modbus TCP / IP protocol	10/100 Base TX port	10/100 Base TX port + 100 Base FX port (fiber optics)	10 Base TX port	
RS 485 (2-wire / 4-wire) ports Modbus protocol	2	2	1	
Number of devices connected directly	64	64	10	
RS 232 configuration ports	1	1	1	
Miscellaneous			■ 1 modem port ■ SMTP client ■ 6 I / 2 O	
	page XXX		**page XXX**	**page XXX**

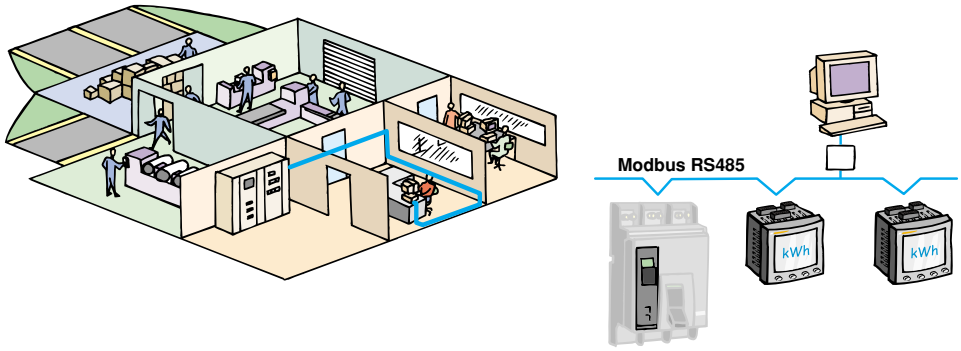
Examples of architectures

PowerLogic System can be used in a number of different architectures depending on the layout of the site. It also offers different user profiles simultaneously.

Example 1

- installation in a small building or isolated equipment room
- one or more metering/monitoring units connected to a simple PC (directly or via modem)
- for electrical installation monitoring by the maintenance department.

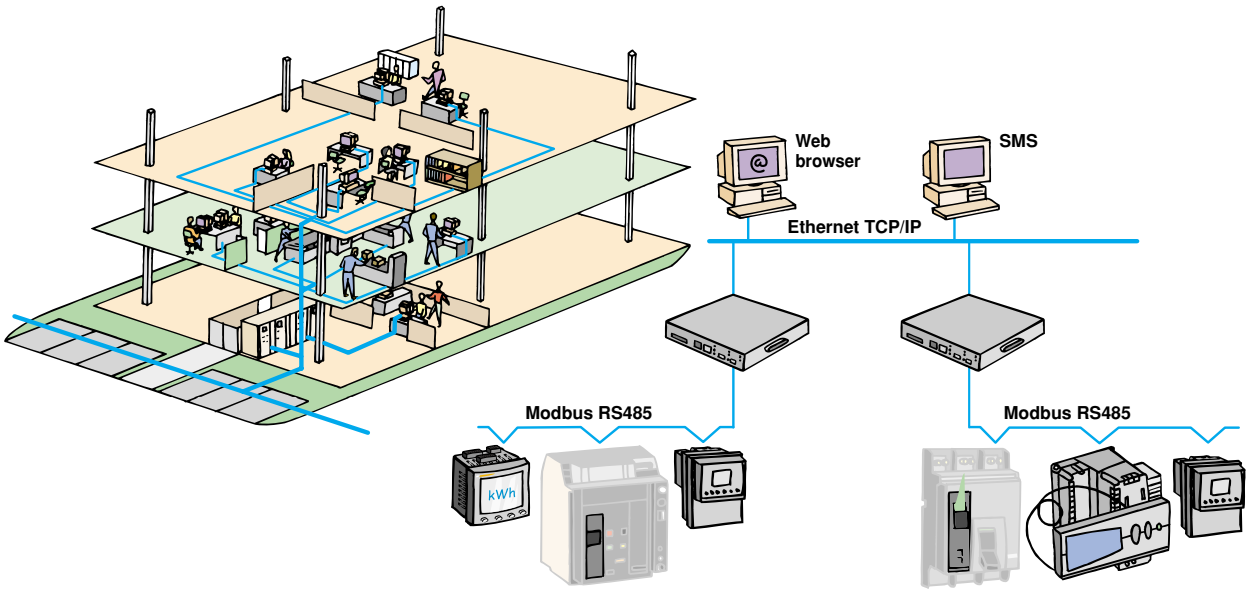
DB103449



Example 2

- installation in a building with a number of users interconnected by a local Intranet
- connection of metering/monitoring units to EGX gateways for integration in the company Ethernet network
- for shared management of the electrical installation by different departments:
  - simple monitoring, with no dedicated software, using a Web browser,
  - complete power monitoring using SMS software.

DB103450

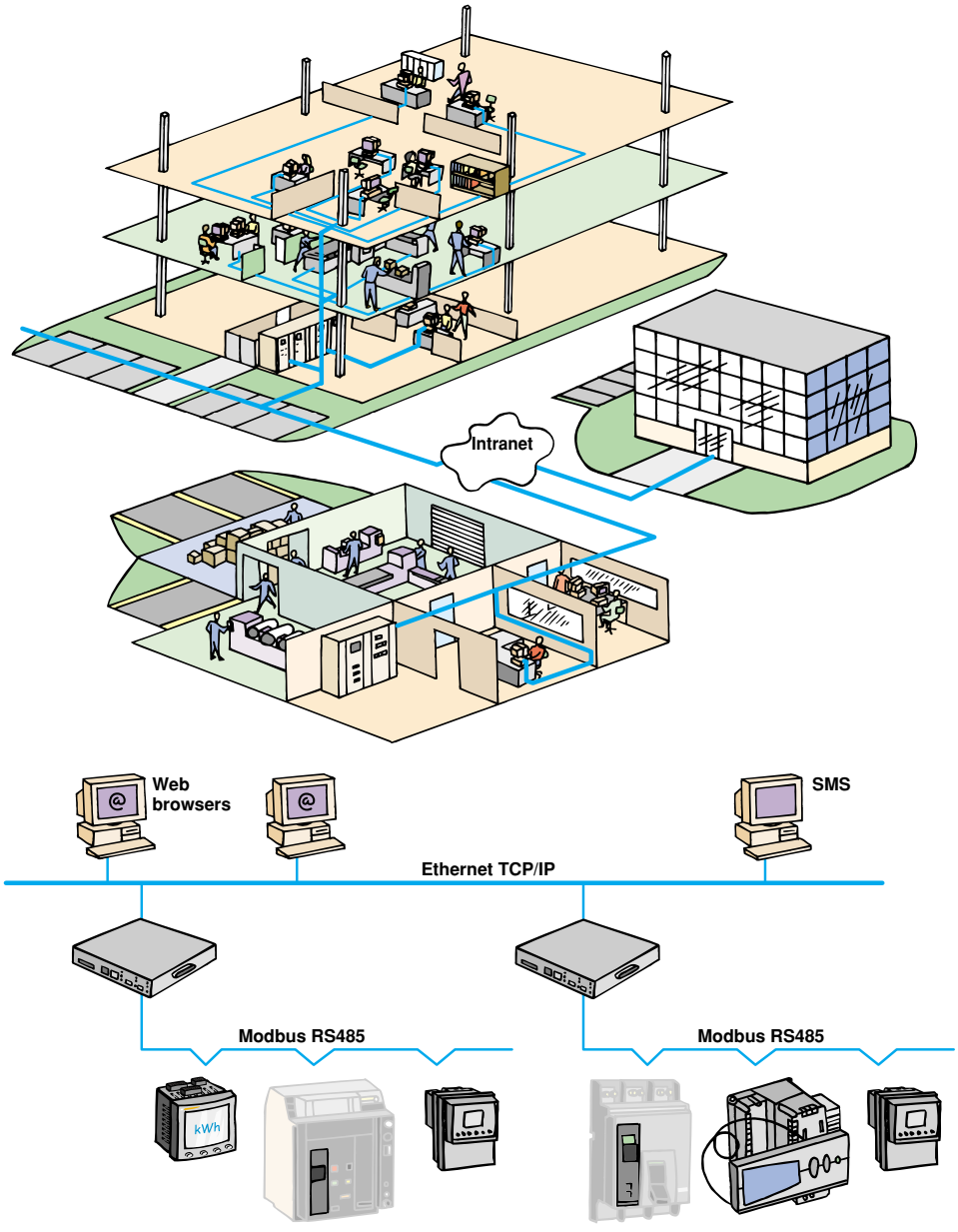


Examples of architectures (cont.)

DB103451

Example 3

- installation in a number of buildings linked by a company Intranet
- connection of metering/monitoring units to EGX Web servers for integration in the company Ethernet network
- all sectors of the company connected to the Intranet have direct access to essential data on the electrical installation via their Web browser.



Circuit Monitor Series 4000
Functions and characteristics

E90463

059162-56

CM4000 + vacuum fluorescent display (VFD).

059161-57

CM4000 + vacuum fluorescent display (VFD).

The PowerLogic Circuit Monitor Series 4000 offers high-performance digital instrumentation, data acquisition and control capabilities. The products integrate easily in power monitoring and control systems due to their Ethernet connections and embedded web server. They are Transparent Ready.

These devices are designed for applications where power quality and availability are critical factors. They are generally used at service entrances and interconnection points or on circuits feeding sensitive equipment. Due to their very wide range of features, including transient detection, it is possible to rapidly solve problems related to poor power quality. EN50160 compliance checking capability makes these products ideal to meet new needs related to market deregulation.

The Circuit Monitor Series 4000 is available in three versions:
- CM4000, with detection of voltage sags and swells
- CM4000XR, with detection of voltage sags and swells and an extended current measurement range
- CM4000T, with detection of voltage sags and swells together with transient detection and flicker measurements.

Applications

Panel instrumentation.
Sub-billing / cost allocation.
Remote monitoring of an electrical installation.
Extensive power-quality monitoring.
Contract and load curve optimisation.
EN50160 electricity supply compliance checking.
Metering of other utilities.

Main characteristics

Detection and capture of voltage sags and swells
Fast identification of problems causing production shutdown.

Detection and capture of short transients less than 1 µs (optional)
Identification of problems due to short disturbances, e.g. switching of capacitors, etc.

Flicker
Measurement of rapid voltage variations.

Electricity quality checking in compliance with EN50160
Fast standardised check on the quality of the electricity supplied.

Detection of major waveform changes
Detection of phase switching phenomena (for example during transfer to engine generator sets) not detected by classical threshold-based alarms.

Ultra-fast recording of electrical parameters every 100 ms or every 20 ms
Preventive maintenance: acquisition of a motor startup curve, etc.

Trend curves and short-term forecasting
Rapid trending and forecasting of upcoming values for better decision making.

Automatic alarm setting
Alarm setpoint learning feature for optimum threshold settings.

Up to 32 Mbytes of memory
For archiving of data and waveforms.

Ethernet 10/100 Mbits/s card and server for HTML pages
Rapid data transfers over an intranet or the internet, simply using a web browser.

Alarm notification via email
High-priority alarms sent directly to the user's PC.

Up to 25 inputs/outputs to monitor the electrical installation
Status of circuit breakers, as well as metering of other commodities, e.g. gas, water, etc.

IEC 60687 and ANSI C12.20 Class 0.2S for energy
Verification of consumption and load curves.

Part numbers

Square D brand	
Circuit Monitor CM4000	**CM4000**
Circuit Monitor CM4000XR	**CM4000XR**
Circuit Monitor CM4000T	**CM4000T**

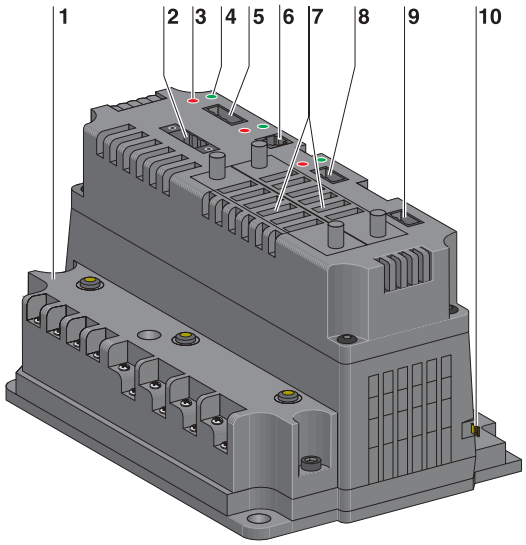
Circuit Monitor Series 4000	
Merlin Gerin brand	
Circuit Monitor CM4000	**CM4000MG**
Circuit Monitor CM4000XR	**CM4000XRMG**
Circuit Monitor CM4000T	**CM4000TMG**

Options

See page 432E2010.fm/4.

Circuit Monitor Series 4000
Functions and characteristics (cont.)

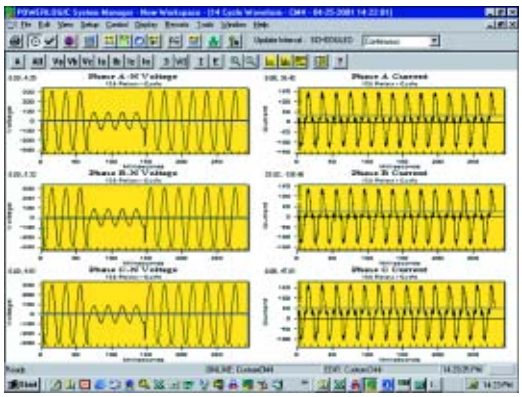
E87291



CM4000

1 *Current/voltage module.*
2 *Control power-supply connector.*
3 *Maintenance LED indicator.*
4 *Power LED indicator.*
5 *RS 485 port with transmit and receive LED indicators.*
6 *Display communication port.*
7 *Slots for optional cards.*
8 *RS 232 port with transmit and receive LED indicators.*
9 *KYZ pulse output.*
10 *Sealable access door.*

E87306



Disturbance waveform capture: detection of a voltage sag.

Selection guide		CM4000 CM4000XR	CM4000T
General			
Use on LV and HV systems		■	■
Current and voltage accuracy		0.07 %	0.07 %
Energy and power accuracy		0.2 % (1)	0.2 %
Nbr of samples/cycle or sample frequency		512	5 MHz
Instantaneous rms values			
Current, voltage, frequency		■	■
Active, reactive, apparent power	Total and per phase	■	■
Power factor	Total and per phase	■	■
Current measurement range extended to 100 A for 1 second		■ (2)	■
Energy values			
Active, reactive, apparent energy		■	■
Settable accumulation modes		■	■
Demand values			
Current	Present and max. values	■	■
Active, reactive, apparent power	Present and max. values	■	■
Predicted active, reactive, apparent power		■	■
Synchronisation of the measurement window		■	■
Setting of calculation mode	Block, sliding	■	■
Power quality measurements			
Harmonic distortion	Current and voltage	■	■
Individual harmonics	Via monitor	63	63
	Via SMS	255	255
Waveform capture		■	■
Detection of voltage swells and sags		■	■
Adaptive waveform capture (up to 64 s)		■	■
Detection and capture of transients (< 1 µs)		-	■
Flicker		-	■
Fast acquisition of 100 ms or 20 ms data		■	■
EN50160 compliance checking (3)		■	■
Programmable (logic and math functions)		■	■
Data recording			
Min/max of instantaneous values		■	■
Data logs		■	■
Event logs		■	■
Trending/forecasting		■	■
Alarms (optional automatic alarm setting)		■	■
Alarm notification via email		ECC21 option	
SER (Sequence of Event Recording)		■	■
Time stamping		■	■
GPS synchronisation (1 ms)		IOC44 option	
Memory expandable up to		32 Mbytes	32 Mbytes
Display and I/O			
Display		CMDLC or CMDVF option	
Multilingual: English, French, Spanish		■	■
Wiring self-test		■	■
Pulse output		■	■
Maximum number of I/Os		25	25
Direct voltage connection		600 V	600 V
Communication			
RS 485 port		2/4 wires	2/4 wires
Infrared port		CMDVF option	
RS 232 port		■	■
Modbus protocol		■	■
Ethernet card (Modbus/TCP/IP protocol)		ECC21 option	
HTML-page web server		ECC21 option	
Ethernet gateway for third-party products		ECC21 option	

(1) *0.5 % for CM4000XR.*
(2) *CM4000XR only.*
(3) *Except for interharmonics, signalling voltages, flicker and transients.*

Circuit Monitor Series 4000
Functions and characteristics (cont.)

The Circuit Monitor has two optional display units, an LCD display and a vacuum fluorescent display (VFD). They may be used for local circuit-monitor setup and operation.

059156

CMDLC display

Back-lit LCD display with four lines and 20 characters per line. The display unit has four navigation buttons, a contrast button and a red alarm LED.
It connects to the Circuit Monitor via a CAB12 cable, 4.2 metres long, supplied with the display.

Part numbers

		Merlin Gerin brand	Square D brand
LCD display supplied with the CAB12 cable		**CMDLCMG**	**CMDLC**
Connection cables: Circuit Monitor <-> display	1.3 m	**CAB4**	**CAB4**
	4.2 m	**CAB12**	**CAB12**
	9.0 m	**CAB30**	**CAB30**

059155

CMDVF display

Vacuum fluorescent display (VFD) with four lines and 20 characters per line.
The display unit has four navigation buttons, a contrast button, a red alarm LED and an infrared port. The infrared port is used with the OCIVF accessory and may serve to set up or operate the Circuit Monitor from a computer.
The display comes with a cable for connection to the Circuit Monitor (CAB12 cable, 4.2 m long).

Part numbers

		Merlin Gerin brand	Square D brand
VFD supplied with the CAB12 cable		**CMDVFMG**	**CMDVF**
Connection cables: Circuit Monitor <-> display	1.3 m	**CAB4**	**CAB4**
	4.2 m	**CAB12**	**CAB12**
	9.0 m	**CAB30**	**CAB30**

059159

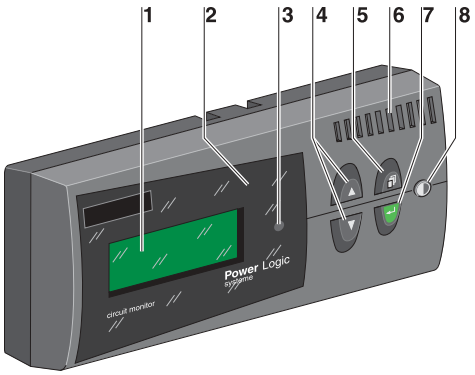
OCIVF optical communication interface

Accessory for transmission between the infrared port on the CMDVF display and a PC computer.

Part number

	Merlin Gerin brand	Square D brand
Optical communication interface	**OCIVF**	**OCIVF**

E87288



Display.

1 *Display screen.*
2 *Infrared port (VFD display only).*
3 *Alarm LED.*
4 *Arrow buttons.*
5 *Menu button.*
6 *Proximity sensor (VFD display only).*
7 *Enter button.*
8 *Contrast button.*

Circuit Monitor Series 4000
Functions and characteristics (cont.)

059141

Ethernet ECC21 communication card

The ECC21 is an optional Ethernet communication card. It may be installed in the slot in the Circuit Monitor intended for options. It has two main functions:
- equip the Circuit Monitor with a fast Ethernet connection over a 10/100 Mbits/s copper link or a 100 Mbits/s fiber-optic link
- serve as an Ethernet gateway for devices daisy chained to its RS 485 ModBus port.

The ECC21 card also includes a server for six HTML pages that may be consulted by a standard web browser. These pages can be customised using WPG software and display information from the host Circuit Monitor and/or devices connected to its ModBus port.

Part number

Ethernet communication card	**ECC21**

059158

CVM current/voltage module

This is the CM4000 acquisition module for currents and voltages. It is supplied already installed on the CM4000. If the Circuit Monitor must be recalibrated, this is the only module requiring recalibration. It may be installed and removed in the field. This module may also be replaced in the field by a CVMT module to transform a CM4000 into a CM4000T.

Part number

Current/voltage module for CM4000	**CVM**

059158

CVMXR current-voltage module

This is the CM4000XR acquisition module for currents and voltages. Current measurement range is extended to:
- 20 In for 1 second or 4 In continuously for 5 A sensors
- 100 In for 1 second or 20 In continuously for 1 A sensors.

The accuracy class is reduced to 0.5S for energy. As for the CVM, it can be added and removed on-site. It is supplied already installed on the CM4000XR.

Part number

CM4000XR current/voltage module	**CVMXR**

059217

CVMT current-voltage module

This is the CM4000T acquisition module for currents and voltages, i.e. it is suitable for the detection of transient phenomena with a 5 MHz voltage-sampling rate. Similar to the CVM, it may be installed and removed in the field. It is supplied already installed on the CM4000T.

Part number

CM4000T current/voltage module	**CVMT**

Memory extension kit

These kits make it possible to extend the Circuit Monitor memory to 16 MB or 32 MB.

Part numbers

16 MB kit	**CM4MEM16M**
32 MB kit	**CM4MEM32M**

Circuit Monitor Series 4000
Functions and characteristics (cont.)

Input/output blocks may be added to the Circuit Monitor to:
- monitor the electrical installation, notably the status of the circuit breakers, and check discrimination between protection devices
- measure the consumption of other commodities by counting the pulses sent by water or gas meters
- measure the temperature of the transformers
- transmit parameters over analog channels to other systems
- etc.

The Circuit Monitor may be equipped with a total of 25 optional digital or analog input/outputs.
These input/outputs may be added in two different manners:
- either using an IOC44 card
- or the IOX input/output extender module and individual input/output modules that connect to the extender.

All these options may be installed in the field. Status changes on the digital inputs are time-stamped to within the millisecond.

059142

IOC44 card

This is an input/output card equipped with:
- 4 digital inputs 20 - 138 V AC/DC
- 4 digital outputs, including 3 relay outputs and a static output that may be programmed as a pulse output. It may be installed in the option-card slots of the Circuit Monitor.

There are three possible configurations:
- 1 IOC44 card
- 2 IOC44 cards
- 1 IOC44 card and 1 Ethernet ECC21 card.

Part number

IOC44 card	**IOC44**

059145

IOX extender equipped with two input/output modules.

059144

IOX2411 pre-equipped extender module.

IOX input/output extender

The IOX input/output extender may be equipped with up to eight plug-in input or output modules. The entire unit connects to the side of the Circuit Monitor.
The input/output modules may be digital or analog.
Three pre-equipped versions may be ordered directly, the IOX08, IOX0404 and IOX2411. Other versions may be user prepared by ordering an empty IOX extender and separate I/O modules (see the section on I/O Modules for selection). In this case, the IOX extender may be equipped with up to a maximum of four analog modules.

Description	
IOX extender	Empty extender with eight slots for separate input and/or output modules, digital or analog, with however a maximum of four analog modules.
IOX08 extender	IOX extender equipped with: 8 digital input modules 120 V AC
IOX0404 extender	IOX extender equipped with: 4 digital input modules 120 V AC 4 analog input modules 4-20 mA
IOX2411 extender	IOX extender equipped with: 2 digital output modules 60 V DC 4 digital input modules 32 V DC 1 analog output module 4-20 mA 1 analog input module 0-5 V

Part numbers

IOX extender	**IOX**
IOX08 extender	**IOX08**
IOX0404 extender	**IOX0404**
IOX2411 extender	**IOX2411**

Circuit Monitor Series 4000
Functions and characteristics (cont.)

Input/output modules

The input/output modules are installed in the slots of the IOX extender. One module corresponds to either one input or one output. A number of versions are available, digital and analog inputs and outputs, and different voltage levels.

Description	
DI120AC module	One digital input 120 V AC
DI240AC module	One digital input 240 V AC
DI32DC module	One polarised digital input 32 V DC, switching time 0.2 ms
DO120AC module	One digital output 120 V AC, 3.5 A max
DO240AC module	One digital output 240 V AC, 3.5 A max
DO200DC module	One digital output 200 V DC, 3.5 A max
DO60DC module	One digital output 60 V DC, 3.5 A max
AI05 module	One analog input 0-5 V DC
AI420 module	One analog input 4-20 mA
AO420 module	One analog output 4-20 mA, max. load 250 Ω

Part numbers

DI120AC module	**DI120AC**
DI240AC module	**DI240AC**
DI32DC module	**DI32DC**
DO120AC module	**DO120AC**
DO240AC module	**DO240AC**
DO200DC module	**DO200DC**
DO60DC module	**DO60DC**
AI05 module	**AI05**
AI420 module	**AI420**
AO420 module	**AO420**

Circuit Monitor Series 4000
Functions and characteristics (cont.)

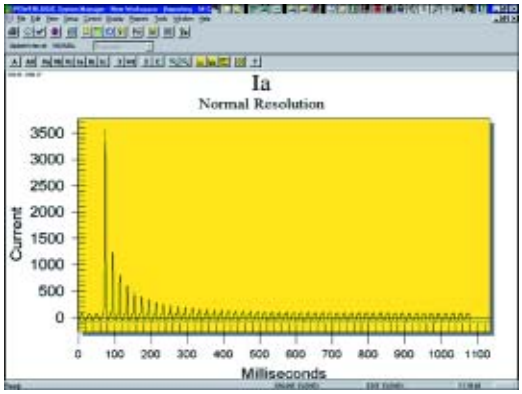
CM4000 + options: ECC21, IOC44 and IOX2411.

Electrical characteristics		
Type of measurement		True rms up to the 255th harmonic On three-phase AC system (3P, 3P + N) Up to 512 samples per cycle
Measurement accuracy	Current and voltage	±0.04 % of reading + ±0.025 % of full scale
	Power	±0.075 % of reading + ±0.025 % of full scale
	Frequency	±0.01 Hz from 45 to 67 Hz ±0.1 Hz from 350 to 450 Hz
	Power factor	±0.002 from 0.5 leading to 0.5 lagging
	Energy:	
	- CM4000/CM4000T	IEC 60687 and ANSI C12.20 Class 0.2S
	- CM4000XR	IEC 60687 and ANSI C12.20 Class 0.5S
Data update rate		1 s in normal mode
Input-voltage characteristics	Measured voltage	0 to 600 V AC (direct) 0 to 1200 kV AC (with external VT)
	Measurement range	0 to 1.5 Un
	Impedance	> 2 MΩ
	Frequency measurement range	45 to 67 Hz and 350 to 450 Hz
Input-current characteristics	CT ratings	Adjustable from 5 A to 30 000 A
	Measurement range	
	- CM4000/CM4000T	5 mA to 10 A
	- CM4000XR	5 mA to 20 A continuous 5 mA to 100 A for 1 second
	Permissible overload	15 A continuous 50 A for 10 seconds per hour 500 A for 1 second per hour
	Impedance	< 0.1 Ω
	Load	< 0.15 VA
Power supply	AC	100 to 275 V AC (±10 %), 50 VA
	DC	125 to 250 V DC (±20 %), 30 W
	Ride-through time	100 ms at 120 V DC
Input/outputs	Pulse output	Static output (240 V AC max, 96 mA max)
	IOC44 card (optional)	4 digital inputs (20-138 V AC/DC), 3 relay outputs (5 A to 240 V AC) 1 static output (96 mA max to 240 V AC)
	IOX extender (optional)	Slots for 8 I/Os
	IOX08 (optional)	8 digital inputs 120 V AC
	IOX0404 (optional) (1)	4 dig. inputs 120 V AC, 4 analog outputs 4-20 mA
	IOX2411 (optional) (1)	2 dig. outputs 120 V AC, 4 dig. inputs 32 V DC, 1 analog input 0-5 V, 1 analog output 4-20 mA
Mechanical characteristics		
Weight		1.9 kg
IP degree of protection (IEC 60529)		IP52
Dimensions CM4000	Without accessories	235.5 x 152.2 x 133.1 mm
	With accessories	235.5 x 202.9 x 133.1 mm
Dimensions CM4000T	Without accessories	235.5 x 165.6 x 133.1 mm
	With accessories	235.5 x 216.3 x 133.1 mm
Environmental conditions		
Operating temperature	Circuit Monitor	-25 °C to +70 °C
	CMDLC display	-20 °C to +60 °C
	CMDVF display	-20 °C to +70 °C
Storage temperature	CM + displays	-40 °C to +85 °C
Humidity rating		5 to 95 % RH at 40 °C
Pollution degree		2
Installation category		II
Dielectric withstand		As per EN61010, UL508, CSA C22.2-2-4-M1987
Electromagnetic compatibility		
Electrostatic discharge		Level 3 (IEC 61000-4-2)
Immunity to radiated fields		Level 3 (IEC 61000-4-3)
Immunity to fast transients		Level 4 (IEC 61000-4-4)
Immunity to impulse waves		Level 4 (IEC 61000-4-5)
Conducted and radiated emissions		CE industrial envir./FCC part 15 class A
Safety		
Europe		CE, as per CEI 61010
USA and Canada		UL508 and CSA C22.2-2-4-M1987

(1) *Operating limits: 0° C to +60 °C. Storage limits: -25 °C to +85 °C.*

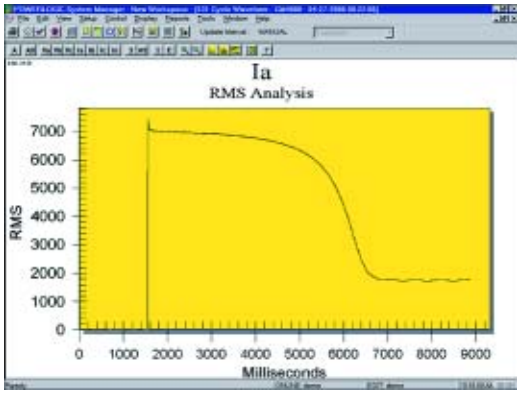
Circuit Monitor Series 4000
Functions and characteristics (cont.)

E87307



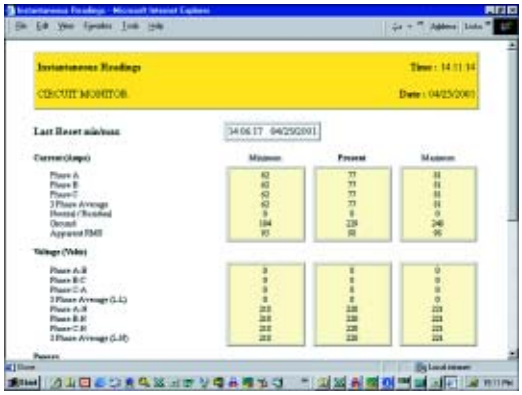
Adaptive waveform capture: transformer inrush current.

E87308



Adaptive waveform capture: motor start, rms value.

E87309



Example CM4000 HTML page showing instantaneous values.

Communication	
RS 485 port (1)	2/4 wires, up to 38400 bauds, Modbus
RS 232 port (1)	Up to 38400 bauds, Modbus, direct connection to a PC or modem
Infrared port (optional) (1)	IrDa, up to 38400 bauds, Modbus
Ethernet ECC21 card with HTML server (optional) (1)	
Copper Ethernet link	10/100 BaseTX, RJ45 connector, 100 m link
Fiber-optic Ethernet link	100 Base FX, LC duplex connector, 1300 nm, FO multimode with gradient index 62.5/125 µm or 50/125 µm, 2000 m link
Protocol	Modbus/TCP/IP
Gateway function for products connected to the ECC21	Master Modbus port, 31 daisy-chained slaves, 63 with repeater, 2/4 wires, 1200 to 38400 bauds, also compatible with the PowerLogic protocol
HTML server	1 standard page, 5 customisable pages
Firmware characteristics	
14 data logs	Up to 96 different parameters, factory-set logs ready to use
One 100 ms data log	Parameters recorded every 100 ms for events
One 20 ms (50 Hz) or 16 ms (60 Hz) data log	Parameters recorded every 20 ms or 16 ms for events
One min/max log	-
One min/max/avg. log	Min/max/avg. values recorded for 23 parameters at regular intervals from 1 to 1440 minutes
One event log	Time stamping to 1 ms, synchro. 1 ms by GPS
Trend curves	Four trend curves: 1 minute, 1 hour, 1 day and 1 month. Min./max./avg. values recorded for eight parameters: - every second for one minute for the 1-minute curve - every minute for one hour for the 1-hour curve - every hour for one day for the 1-day curve - every day for one month for the 1-month curve
Forecasting	Forecasting of the values for the eight parameters for the next four hours and next four days
Waveform captures	Standard: manual launch, 1 cycle, 512 samples, 255th harmonic Disturbance: manual launch or by alarm, adjustable from 512 samples/cycle over 28 cycles to 16 samples/cycle over 915 cycles, response time less than 0.5 cycle, number of cycles before alarm settable from 2 to 10 Adaptive: manual launch or by alarm, adjustable from 512 samples/cycle over 8 seconds to 16 samples/cycle over 264 seconds, capture takes place during a set duration or as long as an alarm is active (to save memory), number of cycles before alarm settable from 2 to 10 Transient: voltage sampling at 5 MHz (83 333 samples/cycle) over 2 ms to capture transient peaks < 1 µs
Alarmes	Threshold alarms: - adjustable pickup and dropout setpoints and time delays, numerous activation levels possible for a given type of alarm - 4 priority levels - 4 response times: standard 1 s, fast 100 ms, disturbance < 1/2 cycle, transient < 1µs - boolean combination of four alarms is possible using the operators NAND, OR, NOR and XOR Automatic alarm setting: after a learning phase, the alarm thresholds are set automatically. The alarms will trip in the event of drift with respect to reference values determined during the learning period. Digital alarms: logic input transitions Waveform alarms: alarm tripping by a special algorithm when the current or voltage waveform is distorted beyond an adjustable level. Makes it possible to detect disturbances that cannot be detected by classical threshold alarms (e.g. phase switching).
Memory	8 Mbytes standard, expandable up to 32 Mbytes
Firmware update	Update via the communication ports
Display characteristics	
CMDLC (optional)	Back lit LCD
CMDVF (optional)	Vacuum fluorescent display (VFD) with IR port
Languages	English, French, Spanish

(1) *All the communication ports may be used simultaneously.*

Product selection according to measurement functions

		Power Meter							
		PM9P/PM9C	**PM500**	**PM700**	**PM700P**	**PM710**	**PM810**	**PM820**	**PM850**
General selection criteria									
Installation		On DIN rail	Flush mount	Flush mount			Flush mount		
Use on LV distribution systems		■	■	■	■	■	■	■	■
Use on LV and HV distribution systems		-	■	■	■	■	■	■	■
Current / voltage accuracy		0.5 %	0.5 %	0.5 %	0.5 %	0.5 %	0.1 %	0.1 %	0.1 %
Power / energy accuracy		2 %	1 %	1 %	1 %	1 %	1 %	0.5 %	0.5 %
Instantaneous rms values									
Current	■ Phases	■	■	■	■	■	■	■	■
	■ Neutral	■	■	■	■	■	■	■	■
	■ Extended measurement range	-	-	-	-	-	-	-	-
Voltage	Simple et composée	■	■	■	■	■	■	■	■
Frequency		■	■	■	■	■	■	■	■
Total power	■ Active	■	■	■	■	■	■	■	■
	■ Reactive	■	■	■	■	■	■	■	■
	■ Apparent	■	■	■	■	■	■	■	■
Power per phase	■ Active	■	■	■	■	■	■	■	■
	■ Reactive	■	■	■	■	■	■	■	■
	■ Apparent	-	■	■	■	■	■	■	■
Power factor	■ Total	■	■	■	■	■	■	■	■
	■ Per phase	-	■	-	-	-	■	■	■
Energy values									
Active energy		■	■	■	■	■	■	■	■
Reactive energy		■	■	■	■	■	■	■	■
Apparent energy		-	■	■	■	■	■	■	■
User-set accumulation mode		-	-	-	-	-	■	■	■
Demand values									
Current	Present and maximum values	-	■	■	■	■	■	■	■
Total active power	Present and maximum values	■	■	■	■	■	■	■	■
Total reactive power	Present and maximum values	-	■	■	■	■	■	■	■
Total apparent power	Present and maximum values	-	■	■	■	■	■	■	■
Total predicted demand	kW, kVAR, kVA	-	-	-	-	-	■	■	■
Synchronisation of calculation window		-	Option	-	-	-	■	■	■
User-set calculation mode		-	-	■	■	■	■	■	■
Power quality measurements									
Total harmonic distortion	■ Voltage	-	■	■	■	■	■	■	■
	■ Current	-	■	■	■	■	■	■	■
Individual harmonic content		-	-	-	-	-	-	■	■
Waveform capture		-	-	-	-	-	-	-	■
Detection of voltage sags and swells		-	-	-	-	-	-	-	-
Programmable (logic and mathematical functions)		-	-	-	-	-	-	-	-
Detection and capture of transients (< 1 µs)		-	-	-	-	-	-	-	-
Flicker		-	-	-	-	-	-	-	-
EN50160 compliance checking		-	-	-	-	-	-	-	-
True rms measurement	Maximum harmonic number	15	31	15	15	15	63	63	63
Sampling rate	Points per cycle	-	-	32	32	32	128	128	128

(1) *Measurement sensors included.*
(2) *Not available with Digipact communication card.*

Product selection according to measurement functions (cont.)

	Circuit Monitor					Micrologic control units for low-voltage circuit breakers		
	CM3250	**CM3350**	**CM4000**	**CM4000XR**	**CM4000T**	**A**	**P**	**H**
	Display in front and module on DIN rail		Display in front and module inside switchboard			Integrated in the circuit breaker		
	■	■	■	■	■	■	■	■
	■	■	■	■	■	-	-	-
	0.1 %	0.1 %	0.07 %	0.07 %	0.07 %	1.5 % **(1)**	1.5 % **(1)**	1.5 % **(1)**
	0.5 %	0.5 %	0.2 %	0.5 %	0.2 %	-	2.0 % **(1)**	2.0 % **(1)**
	■	■	■	■	■	■	■	■
	■	■	■	■	■	■	■	■
	-	-	-	■	-	■	■	■
	■	■	■	■	■	-	■	■
	■	■	■	■	■	-	■	■
	■	■	■	■	■	-	■	■
	■	■	■	■	■	-	■	■
	■	■	■	■	■	-	■	■
	■	■	■	■	■	-	■ **(2)**	■ **(2)**
	■	■	■	■	■	-	■ **(2)**	■ **(2)**
	■	■	■	■	■	-	■ **(2)**	■ **(2)**
	■	■	■	■	■	-	■	■
	■	■	■	■	■	-	■ **(2)**	■ **(2)**
	■	■	■	■	■	-	■	■
	■	■	■	■	■	-	■	■
	■	■	■	■	■	-	■	■
	■	■	■	■	■	-	■	■
	■	■	■	■	■	-	■ **(2)**	■ **(2)**
	■	■	■	■	■	-	■ **(2)**	■ **(2)**
	■	■	■	■	■	-	■ **(2)**	■ **(2)**
	■	■	■	■	■	-	■ **(2)**	■ **(2)**
	■	■	■	■	■	-	-	■ **(2)**
	■	■	■	■	■	-	■ **(2)**	■ **(2)**
	■	■	■	■	■	-	■ **(2)**	■ **(2)**
	■	■	■	■	■	-	-	■
	■	■	■	■	■	-	-	■
	■	■	■	■	■	-	-	■ **(2)**
	■	■	■	■	■	-	-	■ **(2)**
	-	■	■	■	■	-	-	-
	-	-	■	■	■	-	-	-
	-	-	-	-	■	-	-	-
	-	-	-	-	■	-	-	-
	■	■	■	■	■	-	-	-
	63	63	255	255	255	12	31	31
	128	128	512	512	83 333	24	64	64

Product selection according to measurement functions (cont.)

	Power Meter							
	PM9P/PM9C	**PM500**	**PM700**	**PM700P**	**PM710**	**PM810**	**PM820**	**PM850**
Logging								
Min/max of instantaneous values	-	Option	■	■	■	■	■	■
Data logging	-	-	-	-	-	-	2	4
Event logging	-	-	-	-	-	-	■	■
Trend curves	-	-	-	-	-	-	-	■
Alarms	-	Option	-	-	-	■	■	■
Alarm notification via email	-	-	-	-	-	-	-	-
Sequence of Events Recording	-	-	-	-	-	-	-	-
Date and time stamping	-	-	-	-	-	■	■	■
GPS time synchronisation	-	-	-	-	-	-	-	-
Storage capacity	-	-	-	-	-	-	80 Ko	800 Ko
Display, sensors, input/outputs								
Front-panel display	■	■	■	■	■	■	■	■
Built-in current and voltage sensors	-	-	-	-	-	-	-	-
Pulse output	1 (PM9P)	Option	-	2	-	1	1	1
Digital or analogue inputs (max. number)	-	3	-	-	-	13	13	13
Digital or analogue outputs (max. number including pulse outputs)	1 (PM9P)	5	-	2	-	9	9	9
Direct voltage connections without external VT	450 V	480 V	480 V	480 V	480 V	600 V	600 V	600 V
Power supply								
AC/DC version AC	230 V	110 to 400 V	110 to 415 V			110 to 415 V		
AC/DC version DC	-	120 to 350 V	125 to 250 V			125 to 250 V		
DC version	24 to 48 V	24 to 48 V	-			-		
Communication								
RS 485 port	■ (PM9C)	Option	-	-	■	■	■	■
Infra-red port	-	-	-	-	-	-	-	-
RS 232 port	-	-	-	-	-	-	-	-
Modbus (M), Digipact (D) protocol	M	M	-	-	M	M	M	M
Ethernet port (Modbus/TCP/IP protocol)	-	-	-	-	-	-	-	-
HTML Web-page server	-	-	-	-	-	-	-	-
Ethernet gateway for other products on an RS 485 link	-	-	-	-	-	-	-	-

(2) *Not available with Digipact communication card.*
(3) *Maximum only.*
(4) *The total number of inputs and outputs may not exceed 25.*
(5) *Self-powered.*

Product selection according to measurement functions (cont.)

	Circuit Monitor					Micrologic control units for low-voltage circuit breakers		
	CM3250	**CM3350**	**CM4000**	**CM4000XR**	**CM4000T**	**A**	**P**	**H**
	■	■	■	■	■	■ **(3)**	■ **(2)**	■ **(2)**
	14	14	14	14	14	-	-	-
	■	■	■	■	■	-	■ **(2)**	■ **(2)**
	■	■	■	■	■	-	-	-
	■	■	■	■	■	-	■	■
	Option	Option	Option	Option	Option	-	-	-
	■	■	■	■	■	-	-	-
	■	■	■	■	■	-	■	■
	Option	Option	Option	Option	Option	-	-	-
	Up to 8 Mo	Up to 8 Mo	Up to 32 Mo	Up to 32 Mo	Up to 32 Mo	-	-	-
	Option	Option	Option	Option	Option	■	■	■
	-	-	-	-	-	■	■	■
	1	1	1	1	1	-	-	-
	4	4	16 **(4)**	16 **(4)**	16 **(4)**	-	-	-
	5	5	17 **(4)**	17 **(4)**	17 **(4)**	6	6	6
	600 V	600 V	600 V	600 V	600 V	690 V	690 V	690 V
	100 to 275 V		100 to 275 V			**(5)**	**(5)**	**(5)**
	125 to 250 V		125 to 250 V			**(5)**	**(5)**	**(5)**
	-		-			**(5)**	**(5)**	**(5)**
	■	■	■	■	■	Option	Option	Option
	Option	Option	Option	Option	Option	-	-	-
	-	-	■	■	■	-	-	-
	M	M	M	M	M	M, D	M, D	M, D
	Option	Option	Option	Option	Option	-	-	-
	Option	Option	Option	Option	Option	-	-	-
	Option	Option	Option	Option	Option	-	-	-

Power Meter PM500
Functions and characteristics

062052-D

The Power Logic PM500 Power Meter provides all measurement capabilities required to monitor an electrical installation in a single 96 x 96 mm unit. It offers a number of advantages over analogue meters.

Ideal for metering and monitoring applications, it can be integrated in a PowerLogic system to increase the reliability of your installation while cutting costs.

Applications

Panel instrumentation.
Sub-billing / cost allocation.
Remote monitoring of an electrical installation.
Monitoring of harmonics (THD).

Characteristics

Modular and upgradeable
Optional functions and I/O modules provide an optimum solution that perfectly match your needs.

Compact (96 x 96 x 60 mm)
Unit depth just 60 mm or 80 mm with optional modules, for easy integration in switchboards.

Large back lit display with integrated bar charts
Displays 5 measurements at a time for fast readings.

Power and current demand plus THD included in basic version
A high-performance solution for trouble-free monitoring of your electrical installation.

Energy Class 1 as defined by IEC 61036 (4 quadrants)
For sub-billing and cost allocation applications.

059218-24

Modbus RS 485 option.

Part numbers

PM500 Power Meter	
110 to 400 V AC / 120 to 350 V DC	**50980**
24 to 48 V DC	**50981**
Options	
Modbus RS 485 module	**50982**
IO11 Puls module	**50983**
IO22 Alarm module	**50984**
AO20 4-20 mA module	**50985**
IO02 2 Puls module	**50986**

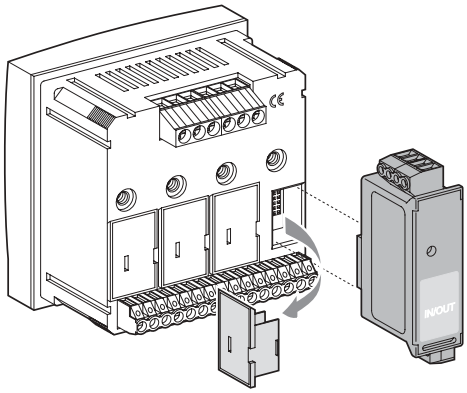
Power Meter PM500
Functions and characteristics (cont.)

E88968

1 *Display instantaneous and demand currents.*
2 *Display voltages and frequency.*
3 *Display instantaneous and demand power.*
4 *Display power factor and total harmonic distortion of current and voltage.*
5 *Display maximum demand current and power values.*
6 *Display energy values and operating times.*
7 *Back lit LCD display.*

PM500		
For LV and HV distribution systems		■
Current and voltage accuracy		0.5 %
Energy and power accuracy (IEC 61036)		1 %
True rms measurements up to		31st harmonic
Maximum number of snap-in modules		4
Display		Back lit LCD
Direct voltage connection		480 V
Instantaneous rms values		
Current	Phases and neutral	■
Voltage	Ph-Ph and Ph-N	■
Frequency		■
Active, reactive, apparent power	Total and per phase	■
Power factor	Total and per phase	■
Energy values		
Active, reactive, apparent energy	4 quadrants	■
Demand values		
Current	Present and max. values	■
Active, reactive, apparent power	Present and max. values	■
Setting of calculation window	5, 8, 10, 15, 20, 30, 60 mn	■
Synchronisation of the measurement		IO11 option
Power quality measurements		
Harmonic distortion	Current and voltage	■

E88969



PM500 options

The PM500 can be fitted with a maximum of 1 optional module of each type.

Modbus RS 485 module	
Modbus RTU 2-wire RS 485 port, up to 38400 bauds Remote readings, settings and reset	■
IO11 Puls module	
Synchro (1) or digital input	1
Pulsed output for energy metering	1
IO22 Alarm module	
Alarms for I, U, V, F, PF total, P total, Q total, S total, THD Adjustable high and low thresholds, hysteresis and delay	■
Min/Max of instantaneous values on Modbus COM: I, U, THD I, THD U (the calculated value is the min. or max. of the 3 phases), IN, THD IN, F, PF total, P total, Q total	■
Digital inputs for position monitoring or pulse counting	2
Relay outputs for control or alarm functions	2
AO20 4-20 mA module	
0/4-20 mA analogue outputs assignable to I, IN, U, V, F, PF total, P total, Q total, S total	2
IO02 2 Puls module	
Pulsed output for energy metering	2

(1) *To synchronise the demand current and demand power calculation window.*

Power Meter PM500
Functions and characteristics (cont.)

Electrical characteristics		
Type of measurement		True rms up to the 31st harmonic On three-phase (3P, 3P+N), two-phase and single-phase AC systems
Measurement accuracy	Current and voltage	0.5 % of reading
	Power	1 % of reading from 0.8 leading to 0.5 lagging
	Frequency	0.1 %
	Power factor	1 % of reading from 0.5 leading to 0.5 lagging
	Active energy	Class 1 as defined by IEC 61036
	Reactive energy	Class 2 as defined by IEC 61268
Data update rate		1 s
Input-voltage characteristics	Measured voltage	50 to 480 V AC (direct) Up to 400 kV AC (with external PT)
	Permissible overload	1.5 Un
	Frequency measurement range	45 to 65 Hz
Input-current characteristics	CT rating	Adjustable from 5 A to 10 000 A
	Secondary	1 A or 5 A
	Measurement range	18 mA to 10 A
	Permissible overload	20 A continuous 48 A 10 s 150 A 1 s
	Load	0.1 VA
	Isolated current input	2.5 kV
Power supply	AC and DC version	110 to 400 V AC (±10 %), 10 VA
		120 to 350 V DC (±20 %), 10 W
	Other version	24 to 48 V DC (±20 %), 10 W
Input/outputs	Synchro or digital input (IO11 and IO22 option)	10 to 30 V DC
	Digital output (option IO22)	Relay output (5 A at 250 V AC)
	Pulse output (IO11 and IO02 option)	Reed relay output (0.5 A at 100 V DC)
	0/4-20 mA output (AO20 option)	Load from 0 to 600 Ω
Mechanical characteristics		
Weight		0.4 kg
IP degree of protection (IEC 60529)		IP5x front face, IP30 rest of case
Dimensions	Without options	96 x 96 x 60 mm
	With options	96 x 96 x 80 mm
Environmental conditions		
Operating temperature		-10 °C to +55 °C
Storage temperature		-20 °C to +85 °C
Pollution degree		2
Installation category		III for installations up to 277/480 V
Dielectric withstand and impulse withstand		As per IEC 60947-1
Electromagnetic compatibility	Immunity to electrostatic discharges	Level III (IEC 61000-4-2)
	Immunity to radiated fields	Level III (IEC 61000-4-3)
	Immunity to fast transients	Level IV (IEC 61000-4-4)
	Immunity to impulse waves	Level IV (IEC 61000-4-5)
	Conducted and radiated emissions	Class B (CISPR11)
Safety		
		CE
Communication		
RS 485 port (Modbus RS 485 option)		2-wire, up to 38 400 bauds, Modbus RTU, SELV circuit, 6 kV impulse (double insulation)
Display characteristics		
Type		Back lit LCD

72 x 72 UM100 digital voltmeters

Function

The UM100 is a digital voltmeter designed to measure AC voltages. It provides front panel readings on switchboards and is not equipped for communication.
A single device covers all alternating voltages from 0 to 690 V.

Characteristics

Electrical characteristics		
Type of measurement		rms up to the 9th harmonic
Measured voltage without voltage transformer		0 to 690 V
Frequency		47 - 63 Hz
Measurement accuracy (not including sensors)		±1 % of full scale, ±1 digit
Digital display		3-digit LED (999 full-scale count)
Display-refresh time		1.5 s
Consumption		3.5 VA max
Input impedance		> 1 MΩ
Overload capacity	Continuous	1.2 Un
	1 second	2 Un
Electrical safety		as defined by standard IEC 1010-1
Supply voltage		48 - 115 V AC / DC 220 - 240 V AC 380 - 415 V AC
Mechanical characteristics		
Dimensions		DIN 72 x 72 mm
Weight		0.25 kg
Degree of protection (EN50102)	Front face	IP50
	Other faces	IP30 (IP20 for connections)
Front face impact resistance (EN50102)		IK07 (2 Joules)
Vibrations (IEC 68-2-6)	Fc test	2 to 13.2 Hz - 1 mm 13.2 to 100 Hz - 0.7 g
Environment		
Operating temperature range		-20 °C to +70 °C
Storage temperature range		-35 °C to +85 °C
Damp heat (IEC 68-2-30)		6 cycles +25 °C/ +55 °C / RH 95 %
Salt mist (IEC 68-2-52)		Kb test, severity level 2
Electromagnetic compatibility:		
■ electrostatic discharges (IEC 1000-4-2)		Level IV
■ radiated susceptibility (IEC 1000-4-3)		Level III
■ low-energy conducted susceptibility (IEC 1000-4-4)		Level IV
■ high-energy conducted susceptibility (IEC 1000-4-5)		Level IV
■ conducted and radiated emissions (EN50081-2)		Class A

Accessories

Connection

For phase-to-phase or phase-to-neutral measurements on a 3-phase distribution system, the Digipact UM100 voltmeter may be combined with a Telemecanique K1F-027M or Multi 9 7-position CMV voltmeter selector switch (cat. no. 15125 and 16018).

Installation

- on front plate for Prisma cubicle: cat. no. 07898 or 07891
- on door with cut-outs for Prisma cubicle: cat. no. 09330.

Catalogue numbers

Voltage (V)	Cat. no.
48 to 155 V AC / DC	**50831**
220 to 240 V AC	**50832**
380 to 415 V AC	**50834**

72 x 72 IM100 digital ammeters

055791-41

Function

The IM100 is a digital ammeter designed to measure AC currents. It provides front panel readings on switchboards and is not equipped for communication.
A single device covers current-transformer ratings from 5 to 8000 A.

Characteristics

Electrical characteristics		
Type of measurement		rms up to the 9th harmonic
Ratings of associated current transformers		5 to 8000 A (1)
Frequency		47 - 63 Hz
Measurement accuracy (not including sensors)		±1 % of full scale, ±1 digit
Digital display		4-digit LED (9999 full-scale count)
Display-refresh time		1.5 s
Consumption	On power supply	3.5 VA max
	On current transformer	0.5 VA at In
Overload capacity	Continuous	2 In
	3 seconds	6 In
Electrical safety		as defined by standard IEC 1010-1
Supply voltage		48 - 115 V AC / DC 220 - 240 V AC 380 - 415 V AC
Mechanical characteristics		
Dimensions		DIN 72 x 72 mm
Weight		0.25 kg
Degree of protection (EN50102)	Front face	IP50
	Other faces	IP30 (IP20 for connections)
Front face impact resistance (EN50102)		IK07 (2 Joules)
Vibrations (IEC 68-2-6)	Fc test	2 to 13.2 Hz - 1 mm 13.2 to 100 Hz - 0.7 g
Environment		
Operating temperature range		-20 °C to +70 °C
Storage temperature range		-35 °C to +85 °C
Damp heat (IEC 68-2-30)		6 cycles +25 °C/ +55 °C / RH 95 %
Salt mist (IEC 68-2-52)		Kb test, severity level 2
Electromagnetic compatibility:		
■ electrostatic discharges (IEC 1000-4-2)		Level IV
■ radiated susceptibility (IEC 1000-4-3)		Level III
■ low-energy conducted susceptibility (IEC 1000-4-4)		Level IV
■ high-energy conducted susceptibility (IEC 1000-4-5)		Level IV
■ conducted and radiated emissions (EN50081-2)		Class A

(1) *Associated current transformers: secondary output 5 A.*
Available primary ratings:
5-20-25-30-40-50-60-70-75-80-100-120-125-150-200-250-300-400-500-600-700-750-800-1000-1200-1250-1500-2000-2500-3000-4000-5000-6000-7000-7500-8000.
Recommended accuracy class: 1 (as defined by IEC 60044-1).

Accessories

Connection

For measurements on a 3-phase distribution system, the Digipact IM100 ammeter may be combined with a Telemecanique K1F-003M or Multi 9 4-position CMA ammeter selector switch (cat. no. 15126 and 16017).

Installation

- on front plate for Prisma cubicle: cat. no. 07898 or 07891
- on door with cut-outs for Prisma cubicle: cat. no. 09330.

Catalogue numbers

Voltage (V)	Cat. no.
48 to 155 V AC / DC	**50835**
220 to 240 V AC	**50836**
380 to 415 V AC	**50837**

Power-monitoring unit
Power Meter Series 600

Power Meter + display.

The PM600, PM620 and PM650 Power Meters have the following functions:
- true rms measurement of voltage, current, frequency, power and power factor
- measurement of harmonic distortion of current and voltage
- metering of active and reactive energy.

These Power Meters are installed inside the switchboard and can be used independently with an optional front-panel display or connected to a supervisory station for use with SMS software.
Operation with a PC is possible via a Belden type communication cable or an Ethernet gateway.

Selection guide

Panel instrumentation
Sub-billing / cost allocation
Real time monitoring
Monitoring of harmonics (THD)

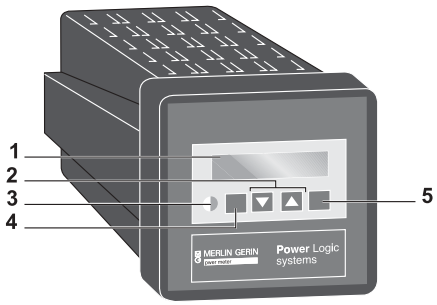
Measurements	PM600	PM620	PM650
Voltage and current (phase and neutral)	■	■	■
Active, reactive and apparent power (per phase and total)	■	■	■
Power factor (per phase and total)	■	■	■
Frequency	■	■	■
Active, reactive and apparent energy (signed)	■	■	■
Harmonic distortion (THD)	-	■	■
Demand current	-	■	■
Active, reactive and apparent demand power	-	■	■
Predicted power demand	-	-	■
Synchronisation of the calculation window	-	-	■
Max/min readings	-	-	■
Date/time stamping	-	■	■
Alarm and event logs	-	-	■
Pulse output	■	■	■ **(*)**
RS485 communication	■	■	■
ModBUS/JBUS protocol	■	■	■
Separate display	■	■	■

(*) *Can also be used as a digital output.*

PM600/PM620/PM650 part numbers		
	Merlin Gerin brand	**Square D brand**
PM600	**3020PM600MG**	**3020PM600**
PM620	**3020PM620MG**	**3020PM620**
PM650	**3020PM650MG**	**3020PM650**
Display part numbers		
	Merlin Gerin brand	**Square D brand**
PMD 32 + 0.3 m cable	**3020PM032MG**	**3020PM032**
Accessory part numbers		
Display connection cable (optional)		
1.2 m cable		**3020SC104**
4.08 m cable		**3020SC112**
9.12 m cable		**3020SC130**

Power-monitoring unit (cont.)
Power Meter Series 600 (cont.)

E58796



1 *2-line liquid crystal display.*
2 *Up/down arrows.*
3 *Contrast button to adjust the display contrast.*
4 *Button used to scroll through available modes.*
5 *Button used to select modes and setup, resets and diagnostics values.*

Electrical characteristics		
Type of measurement		True rms up to the 31st harmonic On three-phase (3P, 3P+N)
Measurement accuracy	current and voltage	0.25 % of reading
	power	0.5 % of reading
	frequency	0.02 Hz
	power factor	1 % of reading
Data update rate		1 s
Input-voltage characteristics	measured voltage	0 to 600 V AC (direct) 0 to 1000 kV AC (with external PT)
	permissible overload	1.2 Un
	frequency measurement range	45 to 66 Hz
Input-current characteristics	CT rating	adjustable from 5 A to 10 000 A
	secondary	1 A or 5 A
	measurement range	0.004 to 1.2 In
	permissible overload	500 A, 1 s
	load	0.15 VA
Power supply	AC version	90 to 600 V AC (± 10%), 30 VA
	DC version	100/300 V DC (± 10%), 6 W
Pulse output		Static output (96 mA at 240 V AC)
Mechanical characteristics		
Weight		0.7 kg
IP Degree of protection (IEC 60529)		IP52 front face, IP30 rest of case
Dimensions		114 x 114 x 154 mm
Environmental conditions		
Operating temperature		0 °C to + 60 °C
Storage temperature		- 20 °C to 70 °C
Humidity rating		5 to 95 % RH at 30 °C
Pollution degree		2
Installation category		II
Dielectric withstand		As per EN 61010-1
Electromagnetic compatibility	immunity to electrostatic discharges	Level III (IEC 61000-4-2)
	immunity to radiated fields	Level III (IEC 61000-4-3)
	immunity to fast transients	Level II (IEC 61000-4-4)
	conducted and radiated emissions	CE (class A)
Safety		
Europe		CE, as per IEC 61010
Communication		
RS485 port		2/4-wire, up to 38 400 bauds, Modbus/Jbus and PowerLogic
Display characteristics		
Type		Back lit LCD

Power-monitoring unit
Circuit Monitor Series 2000

E60626

Circuit Monitor.

054523_B

Power supply and communication accessories.

The CM2150, CM2250, CM2350 and CM2450 Circuit Monitors have the following functions:

- customary measurements: instantaneous and min/max values of voltage, current, power, energy, power factor, frequency, etc.
- measurement of harmonic distortion of current and voltage per phase
- accumulated energy metering
- alarm/event waveform capture and recording (voltage sags/swells)

Operation with a PC is possible via a Belden type communication cable or an Ethernet gateway.

Applications

Panel instrumentation
Sub-billing / cost allocation
Real time monitoring
Advanced power quality monitoring

Selection guide	CM2150	CM2250	CM2350	CM2450
Instantaneous values				
Current, voltage and min/max	■	■	■	■
Active, reactive and apparent power (per phase and total)	■	■	■	■
Power factor (per phase and total)	■	■	■	■
Frequency	■	■	■	■
Temperature (internal ambient)	■	■	■	■
THD (current and voltage)	■	■	■	■
Demand values				
Demand current	■	■	■	■
Average power factor (per phase and total)	■	■	■	■
Demand active power (per phase and total)	■	■	■	■
Predicted demands	■	■	■	■
Energy values				
Accumulated energy (active, reactive and apparent)	■	■	■	■
Bidirectional readings	■	■	■	■
Power analysis				
Date/time stamping of max/min readings	■	■	■	■
Waveform capture for harmonic analysis	-	■	■	■
Disturbance recording	-	-	■	■
Alarm/event logging	■	■	■	■
Programmable for custom applications	-	-	-	■

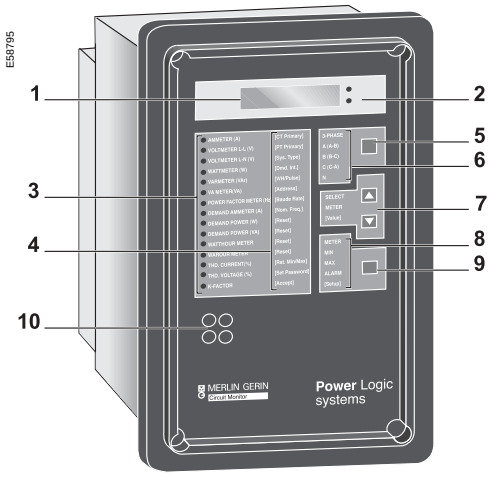
CM2150/CM2250/CM2350/CM2450 part numbers

		Merlin Gerin brand	Square D brand
CM2150	100 K memory	**3020CM2150MG**	**3020CM2150**
	512 K memory	**3020CM2150512KMG**	**3020CM2150512K**
	1024 K memory	**3020CM21501024KMG**	**3020CM21501024K**
CM2250	100 K memory	**3020CM2250MG**	**3020CM2250**
	512 K memory	**3020CM2250512KMG**	**3020CM2250512K**
	1024 K memory	**3020CM22501024KMG**	**3020CM22501024K**
CM2350	100 K memory	**3020CM2350MG**	**3020CM2350**
	512 K memory	**3020CM2350512KMG**	**3020CM2350512K**
	1024 K memory	**3020CM23501024KMG**	**3020CM23501024K**
CM2450	100 K memory	**3020CM2450MG**	**3020CM2450**
	512 K memory	**3020CM2450512KMG**	**3020CM2450512K**
	1024 K memory	**3020CM24501024KMG**	**3020CM24501024K**

Accessory part numbers

See page 432E2240.fm/6.

Power-monitoring unit (cont.)
Circuit Monitor Series 2000 (cont.)



1 *6-digit LED display.*
2 *Kilo/Mega LEDs for units.*
3 *Measurement-type indication LEDs.*
4 *Setup/reset parameters.*
5 *Phase selection button.*
6 *Phase indication LEDs.*
7 *Measurement-type selection button.*
8 *Mode indication LEDs.*
9 *Mode selection button.*
10 *Optical communications port.*

Electrical characteristics		
Type of distribution system		True rms up to the 31st harmonic On three-phase (3P, 3P+N)
Type of measurement		True rms up to the 31st harmonic
Measured voltage	without voltage transformer	115 V AC
	with voltage transformer	1000 kV
Ratings of associated current transformers		15 to 6300 A
Measurement range		0 to 7.4 A
Data update rate		1 second
Frequency		45 - 65 Hz
Measurement accuracy (not including sensors)	currents and voltages	± 0.20 % of reading
	power	± 0.40 % of reading
	frequency	± 0.01 Hz
	power factor	± 1 %
	harmonic distortion	± 1 %
	energy	± 0.40 %
Consumption	on power supply	27 VA max
Input impedance	voltage	> 2 MΩ
	current	< 0.1 Ω
Overload capacity	voltage	600 V max
	current	2 In
Electrical safety		As defined by IEC 1010-1 Front face: class II (IEC 536-2)
Supply voltage		120 to 240 V AC (+10 % -15 %)
Mechanical characteristics		
Weight		3.2 kg
Dimensions		305 x 232 x 94 mm
Environmental conditions		
Operating temperature		-25 °C to +70 °C
Storage temperature		-35 °C to +85 °C
IEC 1000-4-2		Electrostatic discharges
IEC 1000-4-3		Radiated susceptibility
IEC 1000-4-4		Low-energy conducted susceptibility
IEC 1000-4-5		High-energy conducted susceptibility
Communication		
CM2150, CM2250, CM2350, CM2450		Communication via RS485, PowerLogic protocol (*)

(*) Compatible with SMS via RS485 link.

Power-monitoring unit (cont.)
Circuit Monitor Series 2000 (cont.)

064521

IOM input/output modules.

064523_A

OCI2000 optical communications interface.

E60631

CMA100 switchboard mounting adapter.

Input/output modules IOM

Input/output modules can easily be added to the Circuit Monitor.

Part numbers		
IOM11	I/O module: 1 digital input, 1 pulse output	**3020IOM11**
IOM18	I/O module: 8 digital inputs, 1 pulse output	**3020IOM18**
IOM44	I/O module: 4 digital inputs, 1 pulse output, 3 digital outputs	**3020IOM44**
IOM4444-01	I/O module: 4 digital inputs and outputs, 4 analogue inputs and outputs (0-1 mA)	**3020IOM444401**
IOM4444-20	I/O module: 4 digital inputs and outputs, 4 analogue inputs and outputs (4-20 mA)	**3020IOM444420**

Optical communications interface OCI2000

An optical communications interface can be added to allow RS232 communication between the Circuit Monitor and a PC. This interface mounts magnetically to the front of the Circuit Monitor and makes it possible to read information stored in the monitoring unit directly from a PC.

Part numbers		
	Merlin Gerin brand	**Square D brand**
Optical communications interface	**3090OCI2000MG**	**3090OCI2000**

Voltage/power module (autotransformer) VPM277

Part numbers		
	Merlin Gerin brand	**Square D brand**
277/480 V to 120 V transformer module	**3090VPM277C1MG**	**3090VPM277C1**

Switchboard mounting adapter CMA100

For applications where depth in the equipment enclosure is critical, this adapter reduces the depth requirements by extending the Circuit Monitor beyond the front of the switchboard.

Part numbers	
Circuit Monitor mounting adapter	**3090CMA100**

Surface-mount enclosure for Circuit Monitor SMA220

This surface-mount enclosure can be used to house a Circuit Monitor module equipped with an I/O module and a voltage/power module.

Part numbers	
Surface-mount enclosure with door for Circuit Monitor	**3090SMA220**

Control power module CPM48

Part numbers	
16-60 V DC/110 V DC converter	**3090CPM48**

Ride-through module RTM317

This module protects the Circuit Monitor against short power failures lasting up to 8 seconds.

Part numbers	
Ride-through module	**3090RTM317**

Circuit Monitor Series 3000
Functions and characteristics

E90463

62111

Circuit Monitor Series 3000 + vacuum fluorescent display (VFD).

62112-64

Circuit Monitor Series 3000 + vacuum fluorescent display (VFD).

The Power Logic Circuit Monitor CM3250 and CM3350 are high-performance acquisition and control devices offering numerous measurement functions. They integrate easily in power monitoring and control systems due to their Ethernet connections and embedded web server. They are Transparent Ready.

Whether installed at the service entrance, at the head of a switchboard or on sensitive-equipment feeders, Circuit Monitor units record the electrical parameters of the installation. They provide the information required to control costs, improve power quality and reduce equipment downtime.

The CM3350 detects and captures voltage sags and swells that may cause halts in production.

Applications

Panel instrumentation.
Sub-billing / cost allocation.
Remote monitoring of an electrical installation.
Comprehensive power-quality monitoring.
EN50160 electricity supply compliance checking.
Contract and load curve optimisation.
Metering of other utilities

Characteristics

Detection and capture of voltage sags and swells
Rapid identification of the underlying causes of problems.

Trend curves and short-term forecasting
Rapid trending and forecasting of upcoming values for better decision making.

Acquisition of rms values every 100 ms
Preventive maintenance, e.g. acquisition of a motor start-up curve, etc.

Electricity quality checking in compliance with EN50160
Fast standardised check on the quality of the electricity supplied.

8 Mbytes of memory
For archiving of data and waveforms.

Ethernet 10/100 Mbits/s card
Rapid data transfers over an intranet or the internet.

Server for custom HTML pages
Access to the information without any special tools, simply a web browser.

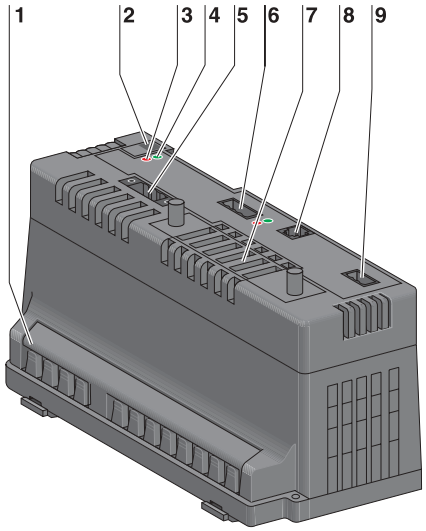
Up to nine input/outputs to monitor the electrical installation
Status of circuit breakers, as well as metering of other commodities, gas, water, etc.

IEC 60687 and ANSI C12.20 Class 0.5S for energy
Verification of consumption and load curves.

Part numbers

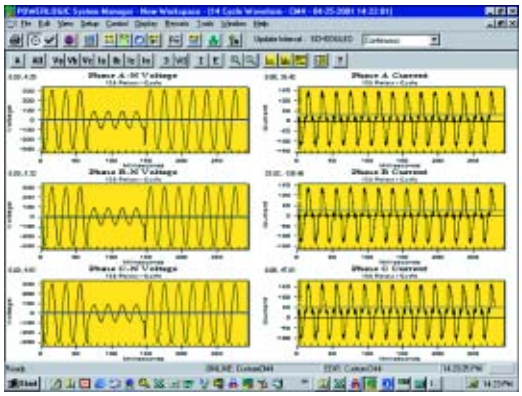
Circuit Monitor Series 3000	
Merlin Gerin brand	
Circuit Monitor CM3250	**CM3250MG**
Circuit Monitor CM3350	**CM3350MG**
Square D brand	
Circuit Monitor CM3250	**CM3250**
Circuit Monitor CM3350	**CM3350**
Options	
See page 432E2250.FM/4.	

Circuit Monitor Series 3000
Functions and characteristics (cont.)



Circuit Monitor Series 3000.

1 *Current/voltage inputs*
2 *Settings lock, sealable access door.*
3 *Maintenance LED indicator.*
4 *Power LED indicator.*
5 *Control power-supply connector.*
6 *RS 485 port with transmit and receive LED indicators.*
7 *Slot for optional card.*
8 *Display communication port.*
9 *KYZ pulse output.*



Disturbance waveform capture: detection of a voltage sag.

Selection guide		CM3250	CM3350
General			
Use on LV and HV systems		■	■
Current and voltage accuracy		0.1 %	0.1 %
Energy and power accuracy		0.5 %	0.5 %
Number of samples per cycle		128	128
Instantaneous rms values			
Current, voltage, frequency		■	■
Active, reactive, apparent power	Total and per phase	■	■
Power factor	Total and per phase	■	■
Energy values			
Active, reactive, apparent energy		■	■
Settable accumulation mode		■	■
Demand values			
Current	Present and max. values	■	■
Active, reactive, apparent power	Present and max. values	■	■
Predicted active, reactive, apparent power		■	■
Synchronisation of the measurement window		■	■
Setting of calculation mode	Block, sliding	■	■
Power-quality measurements			
Harmonic distortion	Current and voltage	■	■
Individual harmonics		63	63
Waveform capture		■	■
Detection of voltage sags and swells		-	■
Fast acquisition of 100 ms data		-	■
Verification of compliance with EN50160 (1)		■	■
Data recording			
Min/max of instantaneous values		■	■
Data logs		■	■
Event logs		■	■
Trending / forecasting		■	■
Alarms		■	■
SER (Sequence of Event Recording)		■	■
Time stamping		■	■
GPS synchronisation (1 ms)		IOC44 option	
8 Mbyte memory		■	■
Display and I/O			
Display		CMDLC or CMDVF option	
Multilingual: French, English, Spanish		■	■
Wiring self-test		■	■
Pulse output		■	■
Maximum number of I/Os		9	9
Direct voltage connection		600 V	600 V
Communication			
RS 485 port		2/4 wires	2/4 wires
Infrared port		CMDVF option	
ModBus protocol		■	■
Ethernet card (Modbus/TCP/IP protocol)		ECC21 option	
HTML-page web server		ECC21 option	
Ethernet gateway for third-party products		ECC21 option	

(1) *Except for interharmonics, signalling voltages, flicker and transients.*

Circuit Monitor Series 3000
Functions and characteristics (cont.)

The Circuit Monitor have two optional display units, an LCD display and a vacuum fluorescent display (VFD). They may be used for local circuit-monitor setup and operation.

059156

CMDLC display

Back-lit LCD display with four lines and 20 characters per line. The display unit has four navigation buttons, a contrast button and a red alarm LED. It connects to the Circuit Monitor via a CAB12 cable, 4.2 metres long, supplied with the display.

Part numbers

		Merlin Gerin brand	Square D brand
LCD display supplied with the CAB12 cable		**CMDLCMG**	**CMDLC**
Connection cables: Circuit Monitor <-> display	1.3 m	**CAB4**	**CAB4**
	4.2 m	**CAB12**	**CAB12**
	9.0 m	**CAB30**	**CAB30**

059155

CMDVF display

Vacuum fluorescent display (VFD) with four lines and 20 characters per line. The display unit has four navigation buttons, a contrast button, a red alarm LED and an infrared port. The infrared port is used with the OCIVF accessory and may serve to set up or operate the circuit monitor from a computer.
The display comes with a cable for connection to the Circuit Monitor (CAB12 cable, 4.2 m long).

Part numbers

		Merlin Gerin brand	Square D brand
VFD supplied with the CAB12 cable		**CMDVFMG**	**CMDVF**
Connection cables: Circuit Monitor <-> display	1.3 m	**CAB4**	**CAB4**
	4.2 m	**CAB12**	**CAB12**
	9.0 m	**CAB30**	**CAB30**

059159

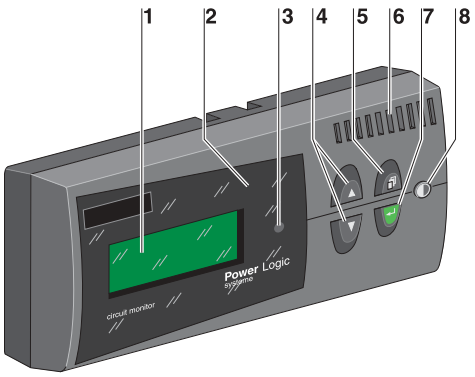
OCIVF optical communication interface

Accessory for transmission between the infrared port on the CMDVF display and a PC computer.

Part number

	Merlin Gerin brand	Square D brand
Optical communication interface	**OCIVF**	**OCIVF**

E87288



Display.

1 *Display screen.*
2 *Infrared port (VFD display only).*
3 *Alarm LED.*
4 *Arrow buttons.*
5 *Menu button.*
6 *Proximity sensor (VFD display only).*
7 *Enter button.*
8 *Contrast button.*

Circuit Monitor Series 3000
Functions and characteristics (cont.)

Ethernet ECC21 communication card

The ECC21 is an optional Ethernet communication card. It may be installed in the slot in the circuit monitor intended for options. It has two main functions:
- equip the circuit monitor with a fast Ethernet connection over a 10/100 Mbits/s copper link or a 100 Mbits/s fiber-optic link
- serve as an Ethernet gateway for devices daisy chained to its RS 485 ModBus port.

The ECC21 card also includes a server for six HTML pages that may be consulted by a standard web browser. These pages can be customised using WPG software and display information from the host circuit monitor and/or devices connected to its ModBus port.

Part number

Ethernet communication card	**ECC21**

IOC44 card

The IOC44 is an optional input/output card equipped with:
- 4 digital inputs 20 - 138 V AC/DC
- 4 digital outputs, including 3 relay outputs and a static output that may be programmed as a pulse output.

Status changes on the digital inputs are time-stamped to within 1 ms. The IOC44 card may be installed in the option-card slot of the circuit monitor and may be used to:
- monitor the electrical installation, notably the status of the circuit breakers, and check discrimination between protection devices
- measure the consumption of other commodities by counting the pulses sent by water or gas meters.

Part number

IOC44 card	**IOC44**

Circuit Monitor Series 3000
Functions and characteristics (cont.)

62109

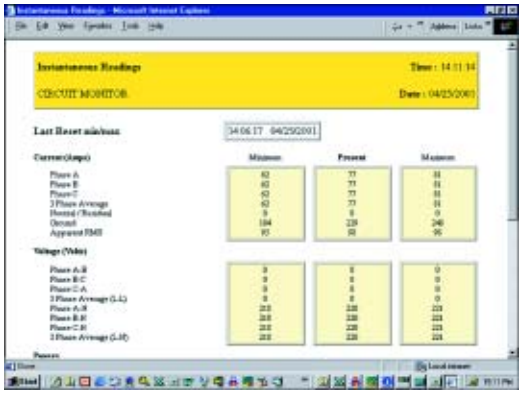
Series 3000 + optional ECC21 or IOC44.

Electrical characteristics		
Type of measurement		True rms up to the 63rd harmonic On three-phase AC system (3P, 3P+N) 128 samples per cycle
Measurement accuracy	Current and voltage	±0.075 % of reading + ±0.025 % of full scale
	Power	±0.075 % of reading + ±0.025 % of full scale
	Frequency	±0.01 Hz from 45 to 67 Hz ±0.01 Hz from 350 to 450 Hz
	Energy	IEC 60687 and ANSI C12.20 Class 0.5S
Data update rate		1 s in normal mode and 100 ms in 100 ms mode
Input-voltage characteristics	Measured voltage	0 to 600 V AC (direct) 0 to 1200 kV AC (with external VT)
	Measurement range	0 to 1.5 Un
	Impedance	> 2 MΩ
	Frequency measurement range	45 to 67 Hz and 350 to 450 Hz
Input-current characteristics	CT ratings	Adjustable from 5 A to 30 000 A
	Measurement range	5 mA to 10 A
	Permissible overload	15 A continuous 50 A for 10 seconds per hour 500 A for 1 second per hour
	Impedance	< 0.1 Ω
	Load	< 0.15 VA
Supply	AC	100 to 275 V AC (±10 %), 27 VA
	DC	125 to 250 V DC (±20 %), 16 W
	Ride-through time	99 ms at 120 V Ac / 75 ms at 125 V DC
Input/outputs	Pulse output	Static output (240 V AC max., 100 mA max.)
	IOC44 card (optional)	4 digital inputs (20-138 V AC/DC), 3 relay outputs (5 A to 240 V AC) 1 static output (96 mA max. at 240 V AC)
Mechanical characteristics		
Weight		1.1 kg
IP degree of protection (IEC 60529)		IP52
Dimensions CM3250/3350		210 x 105 x 143 mm
Environmental conditions		
Operating temperature	CM3250/CM3350	-25 °C to +70 °C
	CMDLC display	-20 °C to +60 °C
	CMDVF display	-20 °C to +70 °C
Storage temperature	CM + displays	-40 °C to +85 °C
Humidity rating		5 to 95% RH at 40 °C
Pollution degree		2
Installation category		III, for distribution systems up to 277/480 V (1)
Dielectric withstand		As per EN61010, UL508
Electromagnetic compatibility		
Electrostatic discharge		Level 3 (IEC 61000-4-2)
Immunity to radiated fields		Level 3 (IEC 61000-4-3)
Immunity to fast transients		Level 3 (IEC 61000-4-4)
Immunity to impulse waves		Level 3 (IEC 61000-4-5)
Conducted and radiated emissions		CE industrial environ./FCC part 15 class A EN55011

(1) *Category II for distribution systems higher than 277/480 V.*

Circuit Monitor Series 3000
Functions and characteristics (cont.)

E87309



Example of a CM3250 HTML page showing instantaneous values.

Safety	
Europe	CE, as per IEC 61010
U.S. and Canada	UL508
Communication	
RS 485 port (1)	2/4 wires, up to 38400 bauds, ModBus, SELV circuit, 6 kV impulse (double insulation)
Infrared port (optional) (1)	IrDa, up to 38400 bauds, ModBus
Ethernet ECC21 card with HTML server (optional) (1)	
Copper Ethernet link	10/100 BaseTX, RJ45 connector, 100-metre link
Fiber-optic Ethernet link	100 Base FX, LC duplex connector, 1300 nm, FO multimode with gradient index 62.5/125 µm or 50/125 µm, 2000-metre link
Protocol	ModBus/TCP/IP
Gateway function for products connected to the ECC21	Master Modbus port, 31 daisy-chained slaves, 63 with repeater, 2/4 wires, 1200 to 38400 bauds, also compatible with the PowerLogic protocol
HTML server	1 standard page, 5 customisable pages
Firmware characteristics	
14 data logs	Up to 96 different parameters, factory-set logs ready to use
One 100 ms data log	Parameters recorded every 100 ms for events (CM3350 only)
One min./max. log	-
One min./max./avg. log	Min./max./avg. values recorded for 23 parameters at regular intervals from 1 to 1440 minutes
One event log	Time stamping to 1 ms, synchronisation 1 ms by GPS
Trend curves	Four trend curves: 1 minute, 1 hour, 1 day and 1 month. Min./max./avg. values recorded for eight parameters: - every second for one minute for the 1-minute curve - every minute for one hour for the 1-hour curve - every hour for one day for the 1-day curve - every day for one month for the 1-month curve
Forecasting	Forecasting of the values for the eight parameters for the next four hours and next four days
Waveform capture	Standard: manual launch, 1 cycle, 128 samples, 63rd harmonic Disturbance: manual launch or by alarm, 128 samples per cycle, adjustable from 12 to 80 cycles, response time less than 0.5 cycle, number of cycles before alarm settable from 2 to 10
Alarms	Adjustable pickup and dropout setpoints and time delays, numerous activation levels possible for a given type of alarm Four priority levels Three response times: standard 1 second, fast 100 ms, disturbance < 0.5 cycle (CM3350 only) Boolean combination of four alarms is possible using the operators NAND, OR, NOR and XOR Digital alarms, e.g. status change of digital inputs
Memory	8 Mbytes standard
Firmware update	Update via the communication ports
Display characteristics	
CMDLC (optional)	Back-lit LCD
CMDVF (optional)	Vacuum fluorescent display (VFD) with IR port
Languages	French, English, Spanish

(1) *All the communication ports may be used simultaneously.*

Power Meter Series 700
Functions and characteristics

PB100708

PB100709

The PowerLogic Power Meter Series 700 offers all the measurement capabilities required to monitor an electrical installation in a single 96 x 96 mm unit extending only 50 mm behind the mounting surface.

With its large display, you can monitor all three phases and neutral at the same time. The anti-glare display features large 11 mm high characters and powerful backlighting for easy reading even in extreme lighting conditions and viewing angles.

The Power Meter Series 700 is available in three versions:
- PM700, basic version with THD and min/max readings
- PM700P, basic version plus two pulse outputs for energy metering
- PM710, basic version plus an RS 485 port for Modbus communication.

Applications
Panel instrumentation.
Sub-billing and cost allocation.
Remote monitoring of an electrical installation.
Harmonic monitoring (THD).

Characteristics
Requires only 50 mm behind mounting surface
The Power Meter Series 700 can be mounted on switchboard doors to maximise free space for electrical devices.

Large back lit display with integrated bar charts
Displays 4 measurements at a time for fast readings.

Intuitive use
Easy navigation using context-sensitive menu.

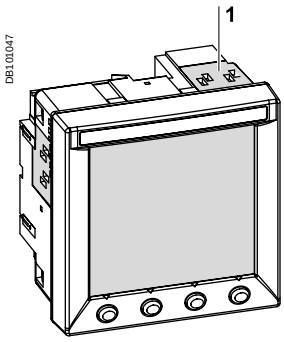
Power and current demand, THD and min/max reading in basic version
A high-performance solution for trouble-free monitoring of your electrical installation.

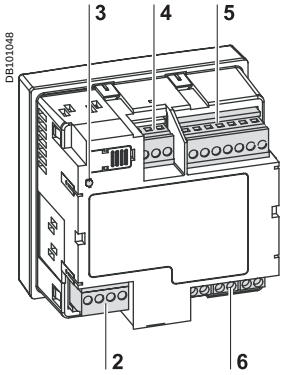
Energy class 1 as defined by IEC 61036
Suitable for sub-billing and cost-allocation applications.

Part numbers

Merlin Gerin brand	
PM700 Power Meter	**PM700MG**
PM700P Power Meter	**PM700PMG**
PM710 Power Meter	**PM710MG**
Square D brand	
PM700 Power Meter	**PM700**
PM700P Power Meter	**PM700P**
PM710 Power Meter	**PM710**

Power Meter Series 700
Functions and characteristics (cont.)





Power Meter Series 700.
1 *Mounting slots.*
2 *RS 485 communications (PM710) or 2 pulse outputs (PM700P).*
3 *Heartbeat LED.*
4 *Power supply.*
5 *Voltage inputs.*
6 *Current inputs.*

Selection guide		PM700	PM700P	PM710
General				
Use on LV and HV systems		■	■	■
Current and voltage accuracy		0.5 %	0.5 %	0.5 %
Energy and power accuracy		1.0 %	1.0 %	1.0 %
Instantaneous rms values				
Current	Phases and neutral	■	■	■
Voltage	Ph-Ph and Ph-N	■	■	■
Frequency		■	■	■
Active, reactive, apparent power	Total and per phase	■	■	■
Power factor	Total	■	■	■
Energy values				
Active, reactive, apparent energy		■	■	■
Demand values				
Current	Present and max.	■	■	■
Active, reactive, apparent power	Present and max.	■	■	■
Setting of calculation mode	Block, sliding	■	■	■
Power quality measurements				
Harmonic distortion	Current and voltage	■	■	■
Data recording				
Min/max of instantaneous values		■	■	■
Display and I/O				
Backlit LCD display		■	■	■
Pulse output		-	2	-
Communication				
RS 485 port		-	-	■
Modbus protocol		-	-	■

Power Meter Series 700
Functions and characteristics (cont.)

PB100710

Rear view of Power Meter Series 700.

Electrical characteristics			
Type of measurement			True rms up to the 15th harmonic On three-phase (3P, 3P + N) two-phase and single-phase AC systems 32 samples per cycle
Measurement accuracy	Current and voltage		0.5 %
	Power		1 %
	Frequency		±0.01 Hz from 45 to 65 Hz
	Active energy		IEC 61036 Class 1
	Reactive energy		IEC 61036 Class 2
Data update rate			1 s
Input-voltage characteristics	Measured voltage		10 to 480 V AC (direct Ph-Ph) 10 to 277 V AC (direct Ph-N) 10 to 1600 kV AC (with external VT)
	Metering over-range		1.2 Un
	Impedance		2 MΩ (Ph-Ph) / 1 MΩ (Ph-N)
	Frequency range		45 to 65 Hz
Input-current characteristics	CT ratings	Primary	Adjustable from 5 A to 32767 A
		Secondary	5 A
	Measurement input range		10 mA to 6 A
	Permissible overload		15 A continuous 50 A for 10 seconds per hour 120 A for 1 second per hour
	Impedance		< 0.1 Ω
	Load		< 0.15 VA
Power supply	AC		110 to 415 ±10 % V AC, 5 VA
	DC		125 to 250 ±20 % V DC, 3 W
	Ride-through time		100 ms at 120 V AC
Output	Pulse output (PM700P)		Static output 240 ±10 % V AC or 300 ±10 % V DC, 100 mA max. at 25 °C, derate 0.56 mA per °C above 25°C, 2.41 kV rms isolation
Mechanical characteristics			
Weight			0.37 kg
IP degree of protection (IEC 60529)			IP52 front display, IP30 meter body
Dimensions			96 x 96 x 69 mm (meter with display) 96 x 96 x 50 mm (behind mounting surface)
Environmental conditions			
Operating temperature	Meter		0 °C to +60 °C
	Display		0 °C to +50 °C
Storage temp.	Meter + display		-40 °C to +85 °C
Humidity rating			5 to 95 % RH at 50 °C (non-condensing)
Pollution degree			2
Metering category			III, for distribution systems up to 277/480 V AC
Dielectric withstand			As per EN61010, UL508
Electromagnetic compatibility			
Electrostatic discharge			Level III (IEC 61000-4-2)
Immunity to radiated fields			Level III (IEC 61000-4-3)
Immunity to fast transients			Level III (IEC 61000-4-4)
Immunity to impulse waves			Level III (IEC 61000-4-5)
Conducted immunity			Level III (IEC 61000-4-6)
Immunity to magnetic fields			Level III (IEC 61000-4-8)
Immunity to voltage dips			Level III (IEC 61000-4-11)
Conducted and radiated emissions			CE commercial environment/FCC part 15 class B EN55011
Harmonics emissions			IEC 61000-3-2
Flicker emissions			IEC 61000-3-3

Power Meter Series 700
Functions and characteristics (cont.)

Safety	
Europe	CE, as per IEC 61010-1
U.S. and Canada	UL508
Communication	
RS 485 port (PM710)	2-wire, up to 19200 bauds, Modbus RTU, SELV circuit, 6 kV impulse (double insulation)
Display characteristics	
Dimensions 73 x 69 mm	Back-lit green LCD (6 lines total, 4 concurrent values)
Firmware characteristics	
Min./max.	Worst min. and max. with phase indication for voltages, currents and THD. Min. and max. values for power factor, power (P, Q, S) and frequency

Power Meter Series 800
Functions and characteristics

PB100313

PB100314

The PowerLogic Power Meter Series 800 offers all the high-performance measurement capabilities required to monitor an electrical installation in a single 96 x 96 mm unit. With its large easy-to-read display, you can monitor all three phases and neutral at the same time. The anti-glare and scratch resistant display features an intuitive interface with context-sensitive menus. A unique white back-light and large digits make it easy to read even in extreme lighting conditions and viewing angles.

The PM800 series features as standard an RS 485 communication port, digital input, digital output, THD metering and alarming in the base unit. In addition, the PM820 and PM850 offer custom on-board logging and individual harmonic current and voltage readings. The PM850 is the first meter in this range to offer waveform capture.

Applications

Panel instrumentation.
Sub-billing / cost allocation / bill checking.
Remote monitoring of an electrical installation.
Basic power quality monitoring.
Contract optimisation and load curves.

Characteristics

Large, easy-to-read display
Multiple values displayed at the same time on an anti-glare display featuring a white back-light.

Easy to operate
Intuitive navigation with context-sensitive menus for easy use.

Maximum functionality and minimum size
Modbus communications and I/Os integrated in a compact unit (96 x 96 x 70 mm).

Harmonics analysis
Monitoring of individual harmonic magnitudes and angles to help you troubleshoot your system.

On-board memory
Critical information stored in non-volatile memory for billing and troubleshooting.

Modular and upgradable
Downloadable firmware and optional modules let you increase the meter capability.

Trend curves and short-term forecasting
Rapid trending and forecasting of upcoming values for better decision making.

IEC 60687 class 0.5S or IEC 61036 class 1 for energy
Sub-billing and cost allocation in 4 quadrants.

PB100892

PM8M22 module.

Part numbers

Power Meter Series 800	
Merlin Gerin brand	
Power Meter PM810	**PM810MG**
Power Meter PM820	**PM820MG**
Power Meter PM850	**PM850MG**
Square D brand	
Power Meter PM810	**PM810**
Power Meter PM820	**PM820**
Power Meter PM850	**PM850**
Options and accessories	
2 relay outputs, 2 digital inputs	**PM8M22**
2 relay outputs, 6 digital inputs	**PM8M26**
2 relay outputs, 2 digital inputs, 2 analog outputs, 2 analog inputs	**PM8M2222**

Power Meter Series 800
Functions and characteristics (cont.)

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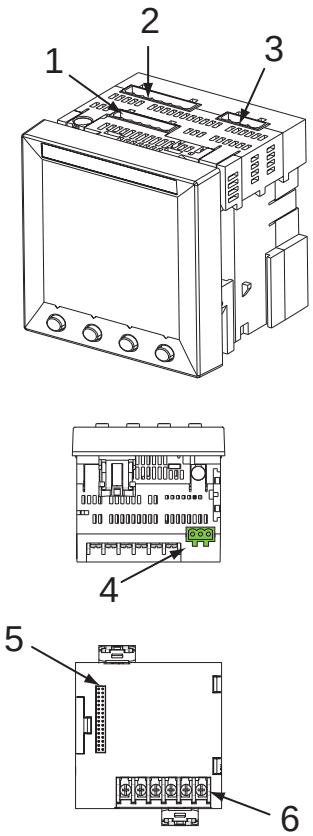

Power Meter Series 800.
1 *Control power supply connector.*
2 *Voltage inputs.*
3 *Digital input/output.*
4 *RS 485 port.*
5 *Option module connector.*
6 *Current inputs.*

Selection guide		PM810	PM820	PM850
General				
Use on LV and HV systems		■	■	■
Current and voltage accuracy		0.1 %	0.1 %	0.1 %
Energy and power accuracy		1 %	0.5 %	0.5 %
Number of samples per cycle		128	128	128
Instantaneous rms values				
Current, voltage, frequency		■	■	■
Active, reactive, apparent power	Total and per phase	■	■	■
Power factor	Total and per phase	■	■	■
Energy values				
Active, reactive, apparent energy		■	■	■
Settable accumulation mode		■	■	■
Demand values				
Current	Present and max. values	■	■	■
Active, reactive, apparent power	Present and max. values	■	■	■
Predicted active, reactive, apparent power		■	■	■
Synchronisation of the measurement window		■	■	■
Setting of calculation mode	Block, sliding	■	■	■
Power-quality measurements				
Harmonic distortion	Current and voltage	■	■	■
Individual harmonics		-	31	63
Waveform capture		-	-	■
Data recording				
Min/max of instantaneous values		■	■	■
Data logs		-	2	4
Event logs		-	■	■
Trending / forecasting		-	-	■
Alarms		■	■	■
Time stamping		■	■	■
Display and I/O				
White backlit LCD Display		■	■	■
Multilingual: English, French, Spanish		■	■	■
Digital input		1	1	1
Digital output or pulse output		1	1	1
Communication				
RS 485 port		2-wire	2-wire	2-wire
Modbus protocol		■	■	■

PM800 options

The PM800 can be fitted with 2 optional modules, unless otherwise indicated (1)

PM8M22 module
2 digital outputs (relays) for control or alarms
2 digital inputs for position monitoring
PM8M26 module
2 digital outputs (relays) for control or alarms
6 digital inputs for position monitoring or pulse counting
This module includes a 24 V DC power supply that can be used to bias the digital inputs
PM8M2222 module
2 digital outputs (relays) for control or alarms
2 digital inputs for position monitoring or pulse counting
2 analog outputs 4-20 mA
2 analog inputs 0-5 V or 4-20 mA

(1) *It is not possible to mount two PM8M22 modules. If the supply voltage of the PM800 is less than 208 V, only one PM8M2222 module can be mounted.*

Power Meter Series 800
Functions and characteristics (cont.)

PB100315

Rear view of Power Meter Series 800.

Electrical characteristics			
Type of measurement			True rms up to the 63rd harmonic On three-phase AC system (3P, 3P + N) 128 samples per cycle
Measurement accuracy	Current and voltage		±0.075 % of reading + ±0.025 % of full scale
	Power	PM810	±0.5 % of reading + ±0.025 % of full scale
		PM820/PM850	±0.15 % of reading + ±0.025 % of full scale
	Frequency		±0.01 Hz from 45 to 67 Hz ±0.01 Hz from 350 to 450 Hz
	Energy	PM810	IEC 61036 Class 1
		PM820/PM850	IEC 60687 and ANSI C12.20 Class 0.5S
Data update rate			1 s
Input-voltage characteristics	Measured voltage		0 to 600 V AC (direct L-L) 0 to 347 V AC (direct L-N) 0 to 3.2 MV AC (with external VT)
	Metering over-range		1.5 Un
	Impedance		2 MΩ (L-L) / 1 MΩ (L-N)
	Frequency measurement range		45 to 67 Hz and 350 to 450 Hz
Input-current characteristics	CT ratings	Primary	Adjustable from 5 A to 327 kA
		Secondary	1 A or 5 A
	Measurement input range		0 to 10 A
	Permissible overload		15 A continuous 50 A for 10 seconds per hour 500 A for 1 second per hour
	Impedance		< 0.1 Ω
	Load		< 0.15 VA
Control Power	AC		110 to 415 ±10 % V AC, 11 VA
	DC		125 to 250 ±20 % V DC, 6 W
	Ride-through time		45 ms at 120 V AC
Input/outputs PM800	Static pulse output		Static output (6 to 220 ±10 % V AC or 3 to 250 ± 10 % V DC, 100 mA max. à 25 °C) 1350 V rms isolation
	Digital input		24 to 125 V AC/DC (±10 %) 5 mA max. burden
Options			
PM8M22	Relay outputs		0 to 240 V AC or 0 to 30 V DC 2 A rms, 5 A max. for 10 seconds per hour
	Digital inputs		19 to 30 V DC, 5 mA max. / 24 V DC
PM8M26	Relay outputs		0 to 240 V AC, 0 to 30 V DC 2 A rms, 5 A max. for 10 seconds per hour
	Digital inputs		20 to 150 V AC/DC, 2 mA max.
	24 V internal supply		20 - 30 V DC, 10 mA max. (feeds 8 digital inputs)
PM8M2222	Relay outputs		0 to 240 V AC, 0 to 30 V DC 2 A rms, 5 A max. for 10 second per hour
	Digital inputs		20 to 150 V AC/DC, 2 mA max.
	Analog outputs		4-20 mA, burden 0 to 600 Ω max.
	Analog inputs		Adjustable from 0 to 5 V DC or 4-20 mA
Switching frequency	PM8M22	Input/output	1 Hz, 50 % duty cycle (500 ms ON/OFF)
	PM8M26 and PM8M2222	Input	25 Hz, 50 % duty cycle (20 ms ON/OFF)
		Output	1 Hz, 50 % duty cycle (500 ms ON/OFF)
Mechanical endurance (digital outputs)			15 million commutations
Electrical endurance (digital outputs)			250000 commutations at 2 A / 250 V AC
Installation category of options			II (1)
Mechanical characteristics			
Weight			0.6 kg
IP degree of protection (IEC 60529)			IP52 front display, IP30 meter body
Dimensions	Without options		96 x 96 x 70 mm (behind mounting surface)
	With 1 option		96 x 96 x 90 mm (behind mounting surface)
Environmental conditions			
Operating temperature	Meter		-25 °C to +70 °C (2)
	Display		-10 °C to +50 °C
Storage temperature	Meter + display		-40 °C to +85 °C
Humidity rating			5 to 95 % RH at 40 °C (non-condensing)
Pollution degree			2
Installation category			III, for distribution systems up to 347 V L-N / 600 V AC L-L
Dielectric withstand			As per EN61010, UL508

Power Meter Series 800
Functions and characteristics (cont.)

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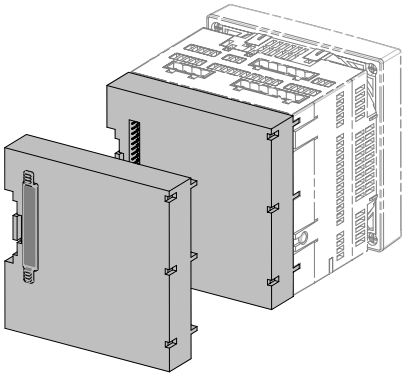

PM800 Series with I/O module.

Electromagnetic compatibility	
Electrostatic discharge	Level III (IEC 61000-4-2)
Immunity to radiated fields	Level III (IEC 61000-4-3)
Immunity to fast transients	Level III (IEC 61000-4-4)
Immunity to impulse waves	Level III (IEC 61000-4-5)
Conducted immunity	Level III (IEC 61000-4-6)
Immunity to magnetic fields	Level III (IEC 61000-4-8)
Immunity to voltage dips	Level III (IEC 61000-4-11)
Conducted and radiated emissions	CE industrial environment/FCC part 15 class A EN55011
Harmonics emissions	IEC 61000-3-2
Flicker emissions	IEC 61000-3-3
Safety	
Europe	CE, as per IEC 61010
U.S. and Canada	UL508
Communication	
RS 485 port	2-wire, up to 38400 bauds, Modbus
Firmware characteristics	
Data Logs	PM820 and PM850: - 1 billing log - 1 customizable log PM850 only: 2 additional custom logs
Min./max.	Worst min. and max. with phase indication for Voltages, Currents, Voltage unbalance, and THD. Min. and max. values for power factor (True and Displacement), power (P, Q, S) and frequency
One event log	Time stamping to 1 second
Trend curves (PM850 only)	Four trend curves: 1 minute, 1 hour, 1 day and 1 month. Min./max./avg. values recorded for eight parameters: - every second for one minute for the 1-minute curve - every minute for one hour for the 1-hour curve - every hour for one day for the 1-day curve - every day for one month for the 1-month curve
Forecasting (PM850 only)	Forecasting of the values for the trended parameters for the next four hours and next four days
Waveform capture	Triggered manually or by alarm, 3-cycle, 128 samples/cycle on 6 user configurable channels
Alarms	Adjustable pickup and dropout setpoints and time delays, numerous activation levels possible for a given type of alarm Four priority levels Response time: 1 second Boolean combination of four alarms is possible using the operators NAND, OR, NOR and XOR on PM850 Digital alarms: status change of digital inputs
Memory available for logging and waveform capture	80 kbytes in PM820 800 kbytes in PM850
Firmware update	Update via the communication ports
Display characteristics	
Dimensions 73 x 69 mm	Back-lit white LCD (6 lines total, 4 concurrent values)
Languages	English, French, Spanish

(1) *Installation category II, for power systems up to 347 V AC / 600 V AC.*
(2) *65 °C if control power is above 305 V AC.*

Power Meter Series PM9
Functions and characteristics

Power Meter Series PM9.

The PowerLogic Power Meter Series PM9 offers all the measurement capabilities required to monitor an electrical installation in a 4-module case (18 mm modules).

They can be used to monitor 2-, 3- and 4-wire low-voltage systems and connect to external current transformers. With the large backlit display, you can monitor all three phases at the same time.

Two versions are available for one or two supply voltages (230 V AC or 24 to 48 V DC):
- PM9P for basic measurements with pulse output
- PM9C for basic measurements with Modbus RS 485 output.

Applications
Panel instrumentation.
Sub-billing / cost allocation.
Remote monitoring of an electrical installation.

Characteristics
Only 72 mm wide (four 18 mm modules)
Compact design for optimised installation.

Large backlit display
Simultaneous monitoring of all three phases.

Demand power
Monitoring of subscribed-power overruns.

IEC 61036 Class 2 for energy
For sub-billing and cost-allocation applications.

Part numbers

Type	Voltage	Width in 9 mm modules	Part no.
Power Meter PM9P	230 V AC	8	**15197**
Power Meter PM9C	230 V AC	8	**15198**
Power Meter PM9P	24 to 48 V DC	8	**15275**
Power Meter PM9C	24 to 48 V DC	8	**15276**

Power Meter Series PM9
Functions and characteristics (cont.)

Selection guide		PM9P	PM9C
General			
Use on LV systems only	1P + N, 3P, 3P + N	■	■
Current and voltage accuracy		0.5 %	0.5 %
Energy and power accuracy		2 %	2 %
Direct voltage connection		450 V	450 V
Instantaneous rms values			
Current	3 phases and neutral	■	■
Voltage	Phase-to-neutral and phase-to-phase	■	■
Frequency		■	■
Active and reactive power	Total and per phase	■	■
Apparent power	Total	■	■
Power factor	Total	■	■
Energy values			
Active energy	2 quadrants	■	■
Reactive energy	2 quadrants	■	■
Demand values			
Active, reactive, apparent power	Present and max. values	■	■
Other measurements			
Hour counter		■	■
Display and I/O			
Backlit LCD display		■	■
Pulse output		1	-
Communication			
RS 485 port		-	■
Modbus protocol		-	■

Power Meter Series PM9
Functions and characteristics (cont.)

Electrical characteristics		
Type of measurement		On single-phase (1P + N) or three-phase (3P, 3P + N) AC systems
Measurement accuracy	Current and voltage	0.5 % of reading
	Power	2 % of reading from pf 0.8 leading to 0.5 lagging
	Frequency	0.2 Hz
	Power factor	2 % from 0.5 leading to 0.5 lagging
	Active energy	IEC 61036 Class 2
	Reactive energy	IEC 61268 Class 2
Input-voltage characteristics	Measured voltage	50 to 450 V AC (direct) and up to 1000 V AC (with external VT)
	Permissible overload	1.15 Un
	Frequency measurement range	45 to 65 Hz
Input-current characteristics	CT ratings	Adjustable from 5 to 10000 A
	Secondary	5 A
	Metering over-range	15 mA to 6 A
	Permissible overload	6 A continuous 20 A 10 s 50 A 1 s
	Load	0.55 VA
	Input current	Not isolated
Control Power	AC	230 V AC (±10 %), < 5 VA
	DC	24 to 48 V DC (±20 %)
Pulse output (PM9P)		Static output, 350 V AC/DC max., 130 mA max. at 25 °C, derating 1 mA/°C above 25 °C, 5 kV insulation
Mechanical characteristics		
Weight		0.3 kg
IP degree of protection		IP52 (front display)
Dimensions		72 x 90 x 66 (mm)
Connection		Tunnel terminals, 1 x 4 mm^2
Environmental conditions		
Operating temperature		-5 °C to +55 °C
Pollution degree		2
Installation category		III for distribution systems up to 260/450 V
Electromagnetic compatibility	Electrostatic discharge	Level III (IEC 61000-4-2)
	Immunity to radiated fields	Level III (IEC 61000-4-3)
	Immunity to fast transients	Level IV (IEC 61000-4-4)
	Immunity to impulse waves	Level IV (IEC 61000-4-5)
	Conducted and radiated emissions	Class B (CISPR11)
Safety		
		CE
Communication		
RS 485 port (PM9C) remote reading and reset		2-wire, 9600 or 19200 bauds, Modbus RTU, ELSV circuit, 6 kV impulse withstand (double insulation)

General information on power-monitoring software

Software, a tool serving site operation.
A site can be compared to a living organism. The power system manger has no control over the changes that affect this organism, but must ensure that it continues to receive the energy it requires.
Similar to a doctor, the power system manager must carry out preventive measures and diagnose and remedy any problems that occur. The goal is to maintain the site in a healthy state, without generating any secondary effects.
Software enables managers to diagnose the causes of most problems encountered on electrical systems.

More and more devices are capable of communicating.
The number of available measurements is also on the rise, creating the need for a tool to successfully manage all the information.
The main purpose of software is to simplify complex sites so that they can be managed by humans:
- make the site and its operation intelligible
- make the power system tangible and visible.

The role of software

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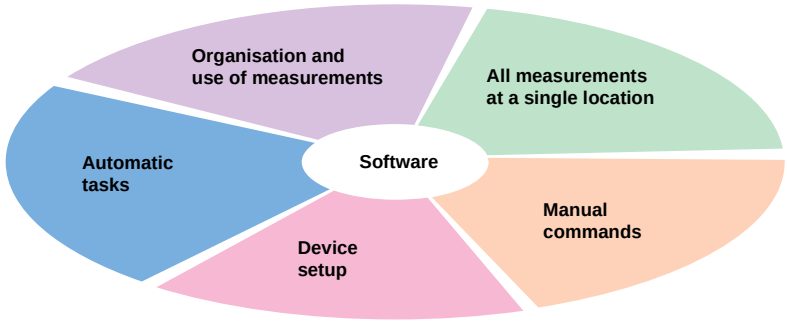

All measurements at a single location

All measured values may be accessed via a PC.

Organisation and use of measurements

Before they may be used, certain measurements must be organised, processed or integrated in special tools.

Examples
- organisation:
  - organisation in tables
  - visual presentation (bar charts, meters)
  - etc.
- processing:
  - classing of events from different devices in chronological order
  - etc.
- tools:
  - display in curve form (selection of intervals, magnifying glass, changes in presentation, etc.).

Device setup, example of a Circuit Monitor

Simple devices may be set up on their front panels.
For devices with advanced functions, local setup is often difficult and even impossible for some functions.
Software greatly facilitates device setup.

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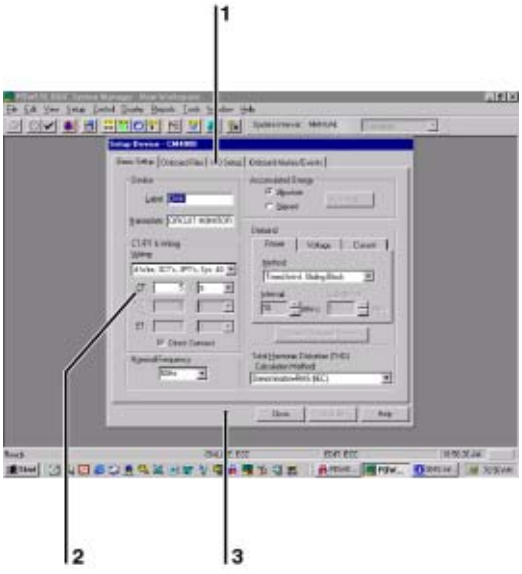

Circuit Monitor setup.

1 *Tabs for access to advanced-function settings.*
2 *CT and VT settings.*
3 *Setup screen for Circuit Monitor basic settings.*

General information on power-monitoring software (cont.)

Automatic tasks

Software can execute tasks automatically, triggered by:

- a date
- an event
- an alarm.

These tasks may concern devices (reset, start of a particular function) or system users (transmission of an e-mail, etc.).

Manual commands

Power-monitoring software can also be used to control devices (e.g. open or close a circuit breaker).
Certain control/monitoring functions (automatic action on electrical-distribution system) are carried out by PLCs integrated in the PowerLogic System architecture.

Access via the Web

Information must be adapted to user needs and then made available to them.
Software can handle the adaptation by preparing custom reports.
These reports can then be accessed by any PC on the site using a standard Web browser.

Software and architecture

Software must be capable of meeting a large number of needs:

- single-user or multi-user operation
- data organisation according to user profiles
- adaptation to different site topologies
- data exchange with other systems
- etc.

This set of constraints means that a single product is not sufficient; a range of software products is required.

SMS software

SMS is a complete power-monitoring software family.
Depending on the required applications and functions, the SMS family offers different software products:
- PMX1500
- SMS121
- SMS1500.

SMS software can communicate with all communicating devices installed in the electrical-distribution system:
- Power Meters and Circuit Monitors
- low-voltage circuit breakers
- Sepam protection relays
- all devices implementing the Modbus protocol.

SMS is a scaleable solution compatible with all types of system architectures, from those with direct connection of various devices to Ethernet-based systems.

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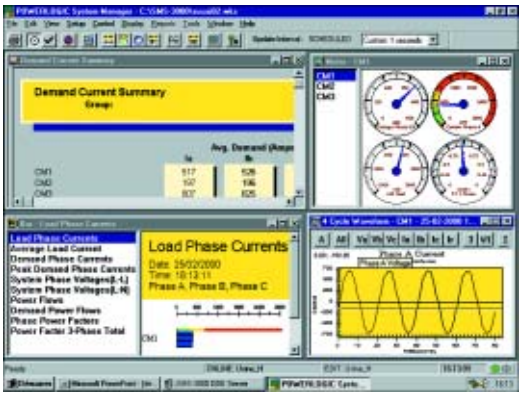
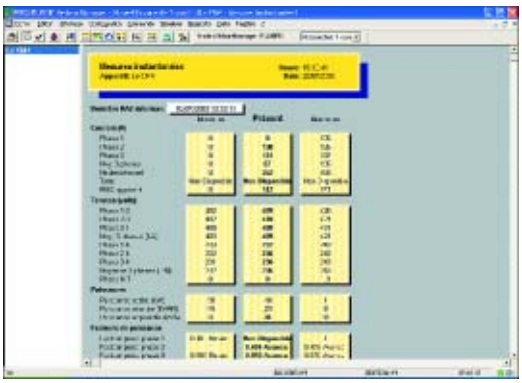


An overall system view - the control panel.

Functions

SMS offers a wide range of functions:
- simple pre-configured functions:
  - data tables
  - meters and bar charts
  - historical logging and trending
  - display of waveforms
  - harmonic analysis
  - event logging
  - min/max resetting
  - control
  - device setup
- advanced functions that the users can customise:
  - user-defined tables and reports
  - setup of automatic tasks
  - graphic interface customised via the GFX option.

DB100975

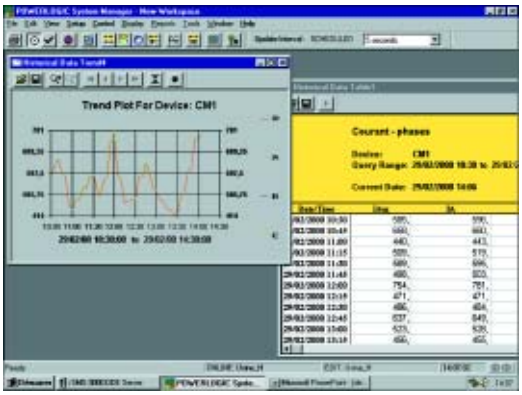


Data tables.

Data tables, meters and bar charts
SMS can supply a wide range of measurements in real time via tables, bar charts or meters.
SMS is pre-configured to accept and display the data supplied by the devices.
Users can also create their own customised tables.
Simply select one or more devices, the desired measurements, and the table is created automatically.

Historical logging and trending
SMS automatically saves the data from the devices to a central data base.
The data can be retrieved, displayed or printed as tables, trend curves or reports.

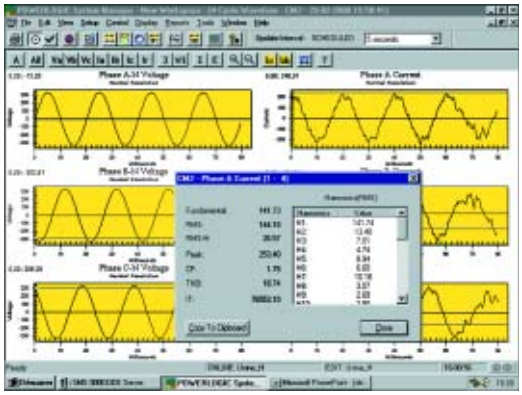
E87267



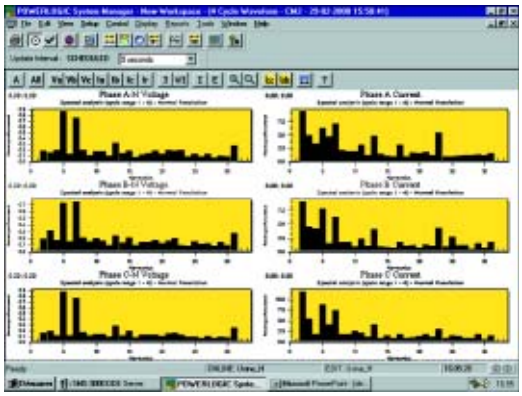
Historical logging and trending.

SMS software (cont.)

E87268

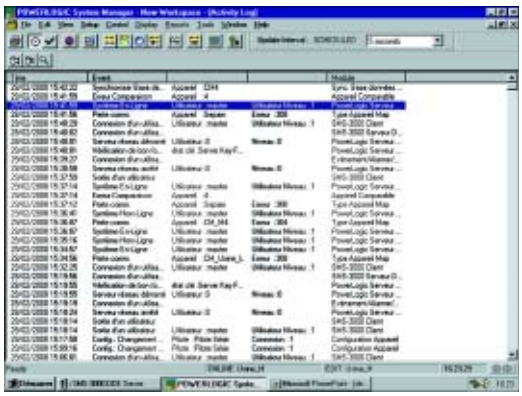


E87269



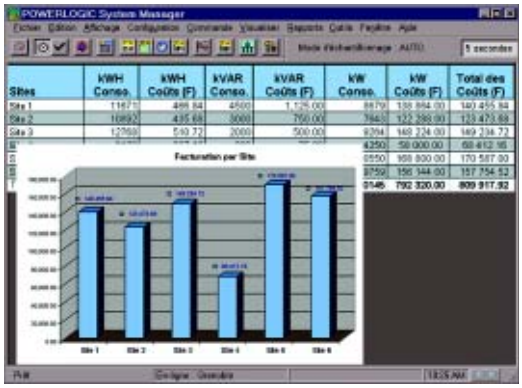
Waveforms and harmonics.

E87270



Event log.

E87271



Cost allocation report.

Waveform display and harmonic analysis
The data is presented in graphs.
The current and voltage waveforms may be viewed simultaneously or individually, and can be printed.
If the waveform capture is over four cycles, it is possible to display the percentage of each harmonic order and the total harmonic distortion (THD).

Event logging
SMS logs all events including alarms.
Events may be of any type, from power outages to configuration changes.
All user action on the system is recorded and can be displayed, printed or deleted at all times.
For each event, the following fields are displayed on the screen:
- device
- date and time
- type of event
- user name.

This make it possible to recover all the necessary information for system diagnostics.

SMS can be used to link alarms to digital and analog inputs in addition to those that can be set up directly on certain devices.
User-set values can be used as alarm conditions.
The alarm parameters can be set with a number of security levels.
Each level corresponds to audio and visible indications, a password and actions.
Each level can be set up with different sounds, colours, actions, etc.

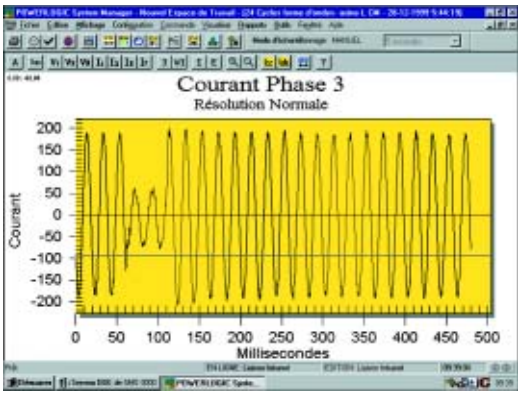
Management of user rights
SMS can handle an unlimited number of users, each with their own name and password.
In addition, SMS manages different levels of user rights to restrict access to strategic functions.

Control
SMS can be used to control devices (e.g. opening and closing of circuit breakers).
To avoid accidental and unauthorised use, only users with appropriate rights can access this function.
SMS can also be used to reset min/max values stored in the devices.

Creation of custom reports
SMS can be used to create reports from all types of data, including real-time values.
SMS can use standard or user-customised report formats.
These reports can be saved in HTML format for (display via a Web browser,use and formatting with Excel).

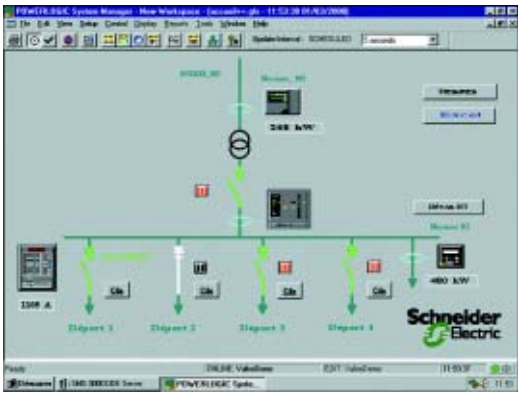
SMS software (cont.)

E87272



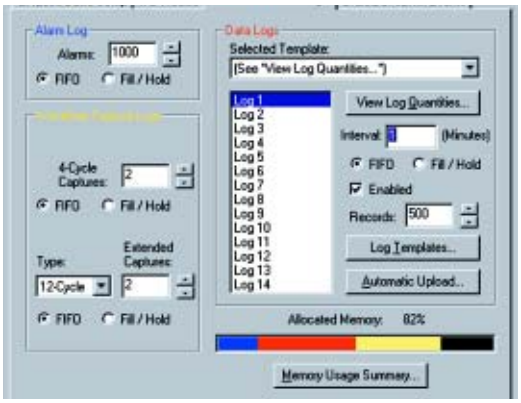
Waveform capture.

E87273



GFX screen.

E87275



Setting Circuit Monitor advanced functions.

E87274

Help screen.

Automatic tasks
The available tasks include launching programs, resetting devices, sending e-mail, data acquisition and waveform capture.
A task may be launched when an alarm is detected or at a precise time set by the user.

Animated graphics via the GFX option
The GFX interactive graphics option offers a wide range of presentations, including single-line diagrams, electrical switchboards and site and building diagrams.
GFX offers complete customisation functions for these graphic presentations.

Organisation in groups
The devices can be organised in groups which makes it possible to select them according to function or the organisation of the electrical-distribution system.
This function makes it possible to logically structure the devices and data, e.g. by building, by voltage level, by function, etc.

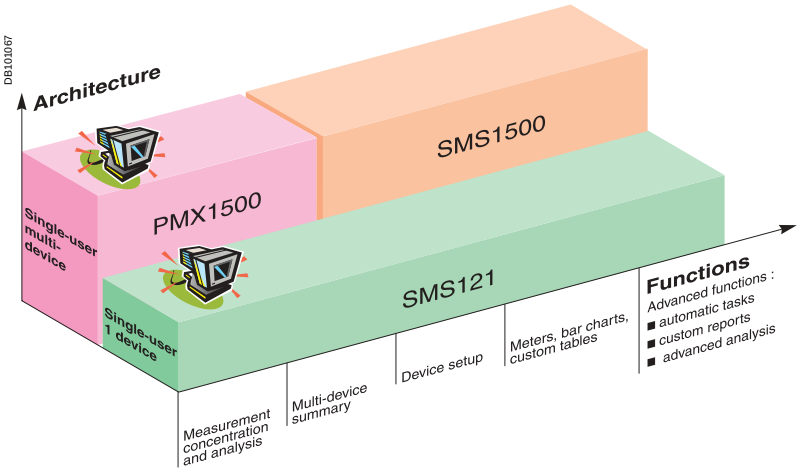
Device setup, example of a Circuit Monitor
Simple devices may be set up on their front panel.
For devices with advanced functions, local setup is difficult and even impossible for some functions.
Software greatly facilitates device setup.

Data exchange
Data available in SMS can be used in other applications, for example in an Excel spreadsheet or a with a global supervisor.
SMS can also read, display and save data or alarms from other applications such as a process-control or building management system..

Help system
SMS comprises a complete, on-line help system that takes into account the screen where help is needed.
The help is divided into chapters that may be printed. Most of the configuration dialog boxes include a help button offering direct access to the information on the concerned dialog.

SMS software (cont.)

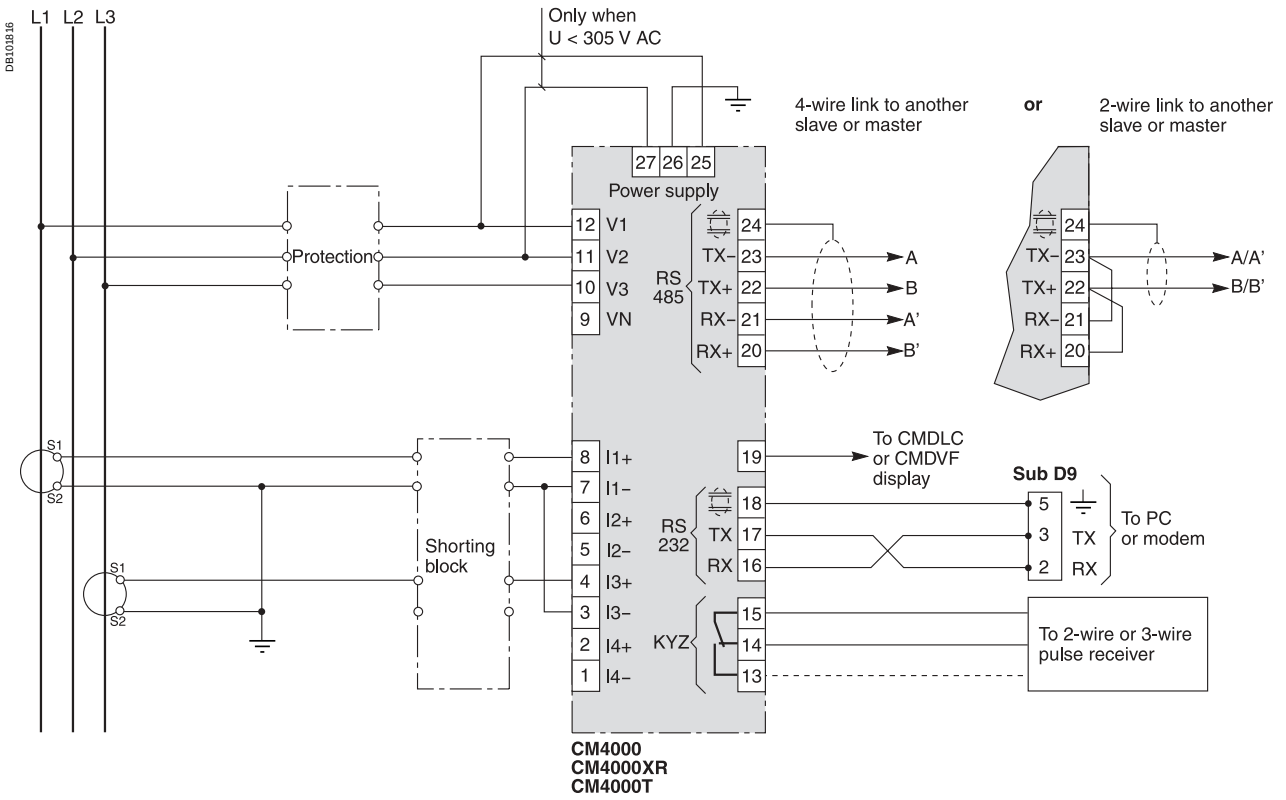
Software selection guide



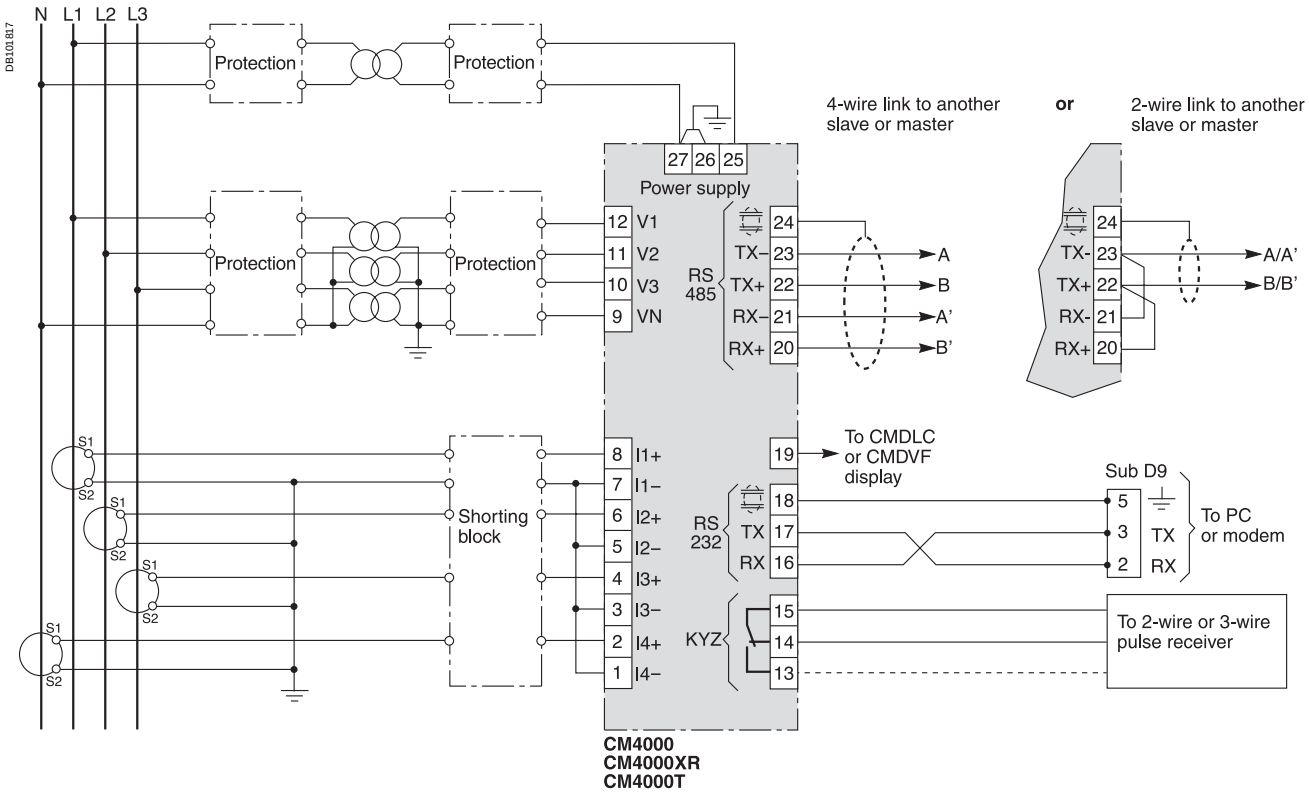
	PMX1500	SMS121	SMS1500
Functions			
Device setup	■	■	■
Min/max reset	■	■	■
Issuing of controls	■	■	■
Data tables	■	■	■
Customisable alarms	■	■	■
Event and alarm logging	■	■	■
Display of historical data and trending	■	■	■
Waveforms	■	■	■
Harmonic analysis	■	■	■
Reports	■	■	■
Bar charts		■	■
Meters		■	■
Automatic tasks		■	■
Custom reports		■	■
Cost allocation reports		■	■
Custom tables		■	■
Custom animated graphics option (GFX)	■	■	■
Single-user architecture			
One device at a time		■	
Multi-device	■		■

Circuit Monitor Series 4000
Installation and connection

3-wire connection with 2 CTs and no PT

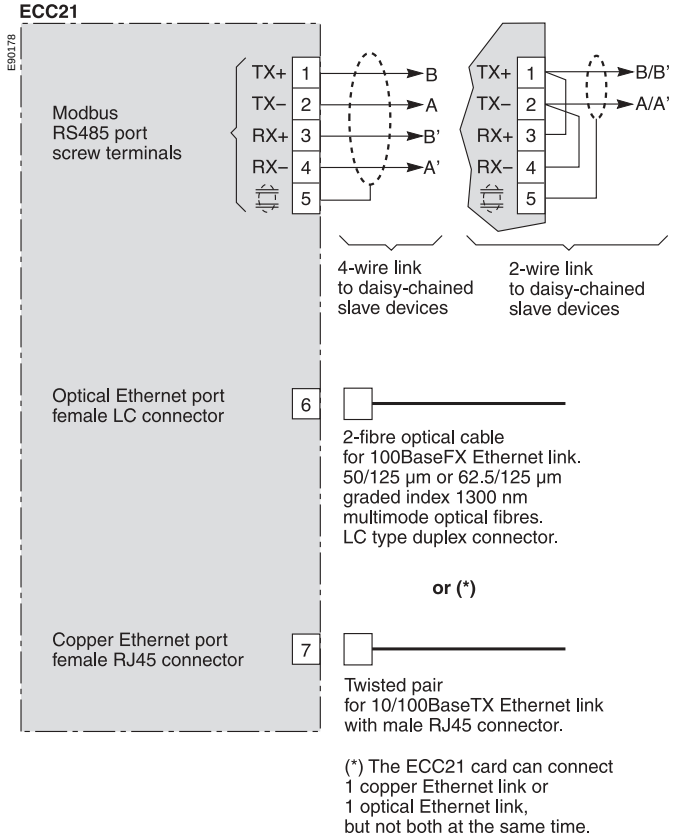


4-wire connection with 4 CTs and 3PTs

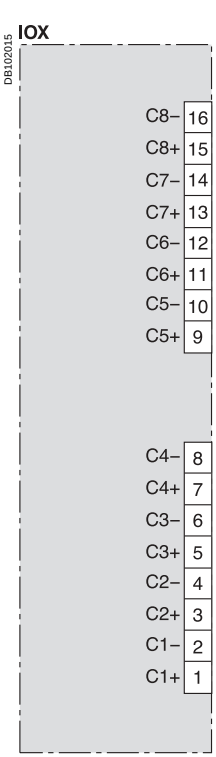


Circuit Monitor Series 4000
Installation and connection (cont.)

Ethernet ECC21 communication card

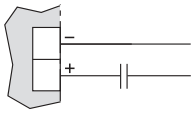


IOX input/output extender

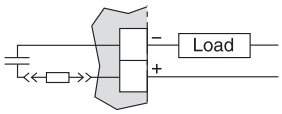


Example of input/output module connections

Digital input module

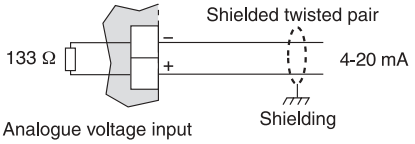


Digital output module

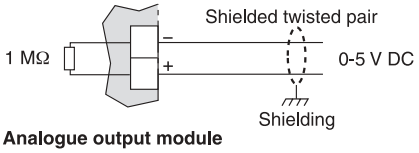


Analogue input module

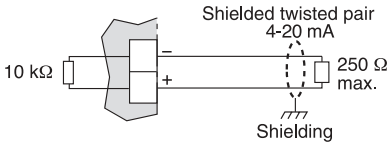
Analogue current input



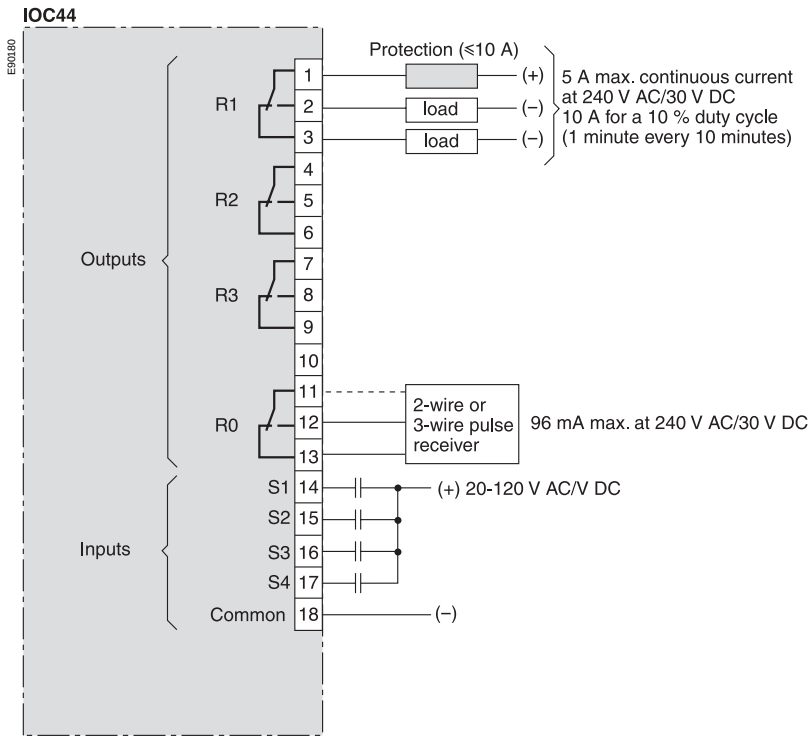
Analogue voltage input



Analogue output module

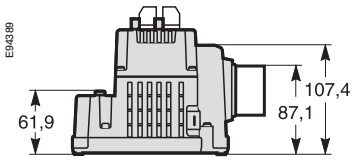


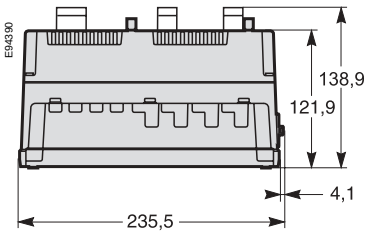
IOC44 input/output card

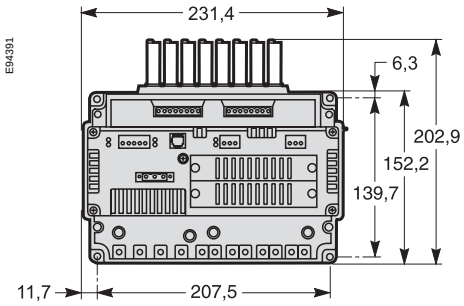


Circuit Monitor Series 4000
Installation and connection (cont.)

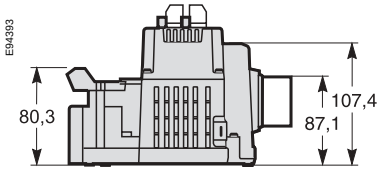
CM4000 / CM4000XR dimensions

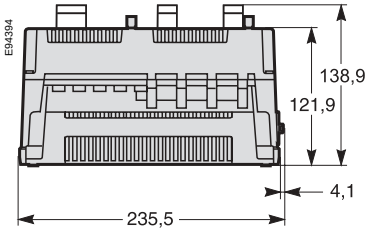


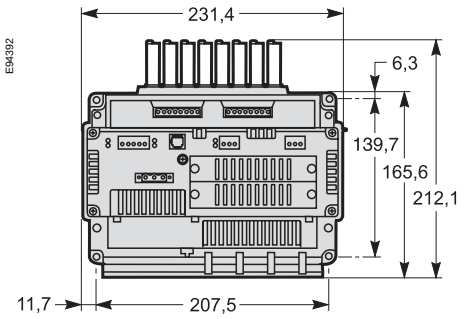




CM4000T dimensions

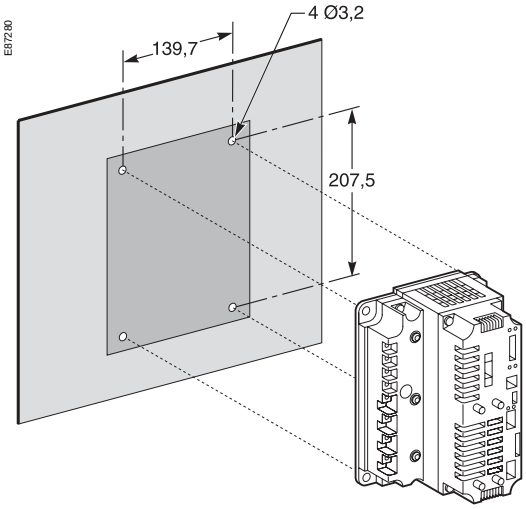




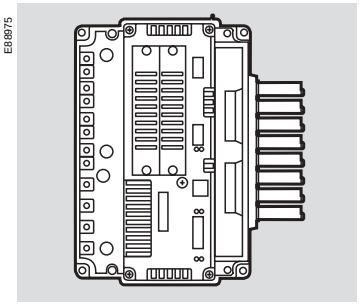


Circuit Monitor Series 4000
Installation and connection (cont.)

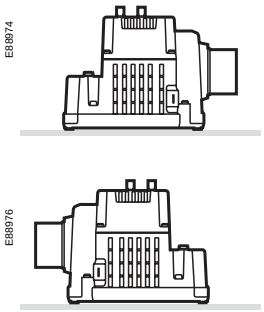
Mounting on a backplate



Mounting possibilities

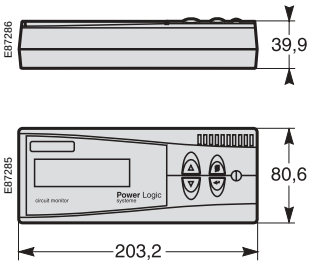


Vertical mounting.

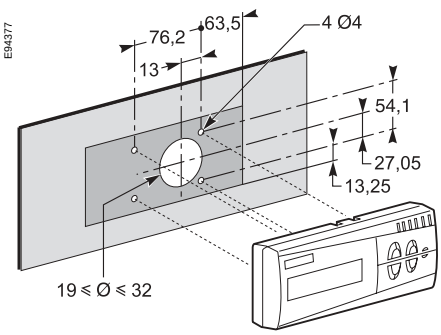


Horizontal mounting.

CMDLC/CMDVF dimensions

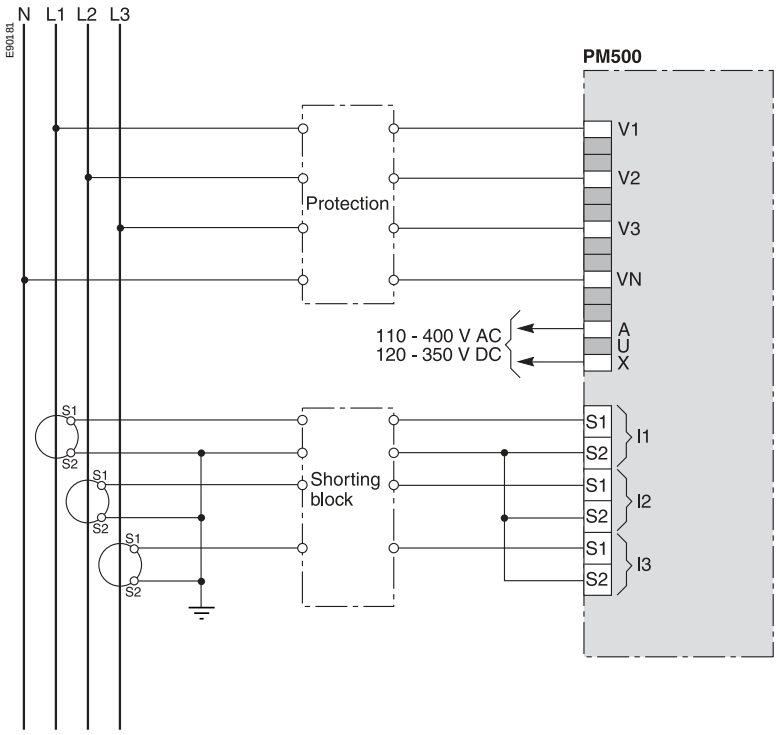


Mounting on a backplate



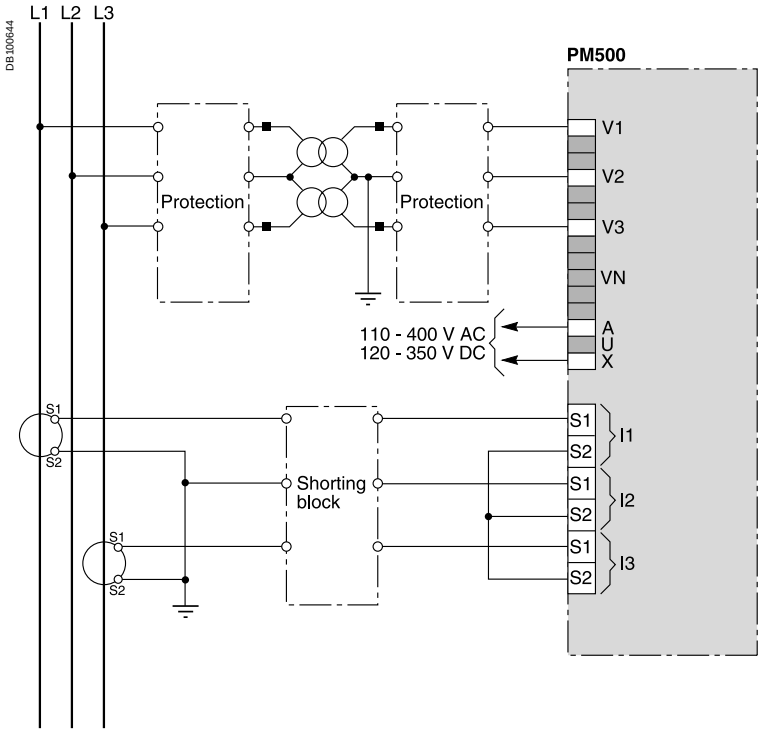
Power Meter PM500
Installation and connection

4-wire connection with 3 CTs and no PT



Connection example.

3-wire connection with 2 CTs and 2 PTs

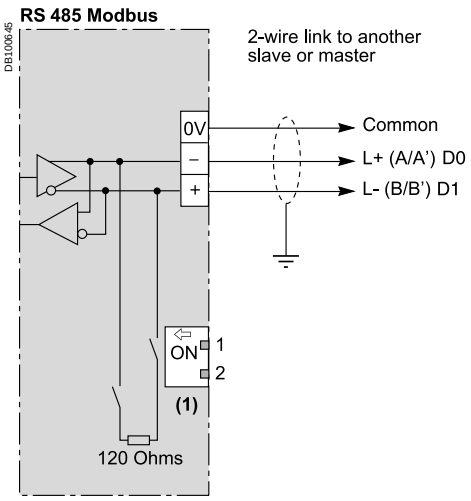


Connection example.

Note: *Other types of connection are possible. See product documentation.*

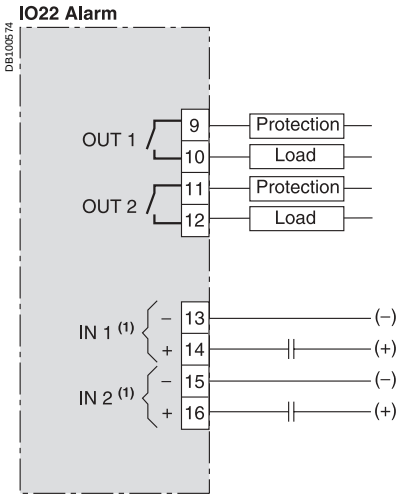
Power Meter PM500
Installation and connection (cont.)

Modbus RS 485 module



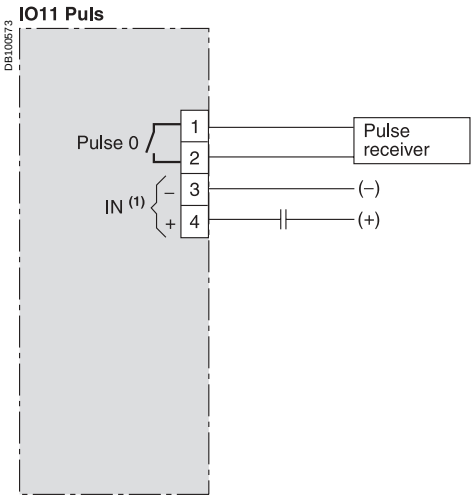
(1) *Flip switches 1 and 2 in the direction of the arrow to insert a resistance of 120 Ω. This resistance should be inserted when the PM500 is located at the end of an RS 485 line.*

IO22 Alarm module



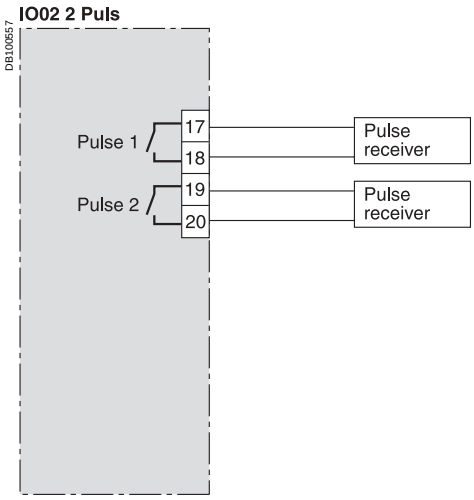
(1) *Volt free (external power supply).*

IO11 Puls module

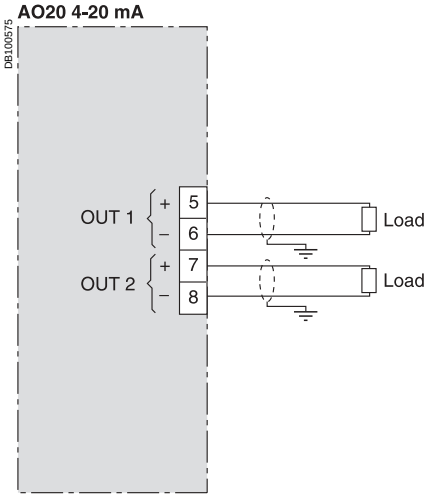


(1) *Volt free (external power supply).*

IO02 2 Puls module

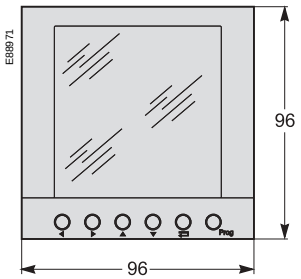


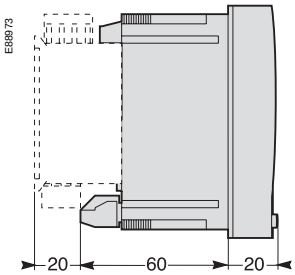
AO20 4-20 mA module

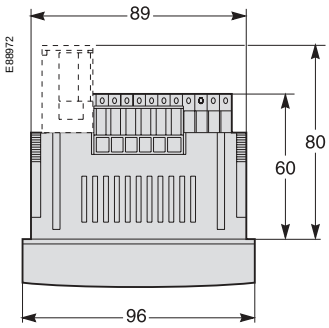


Power Meter PM500
Installation and connection (cont.)

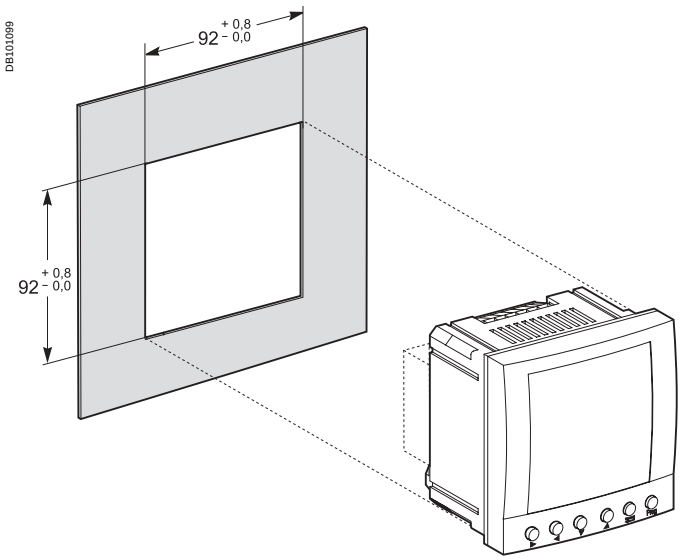
Dimensions



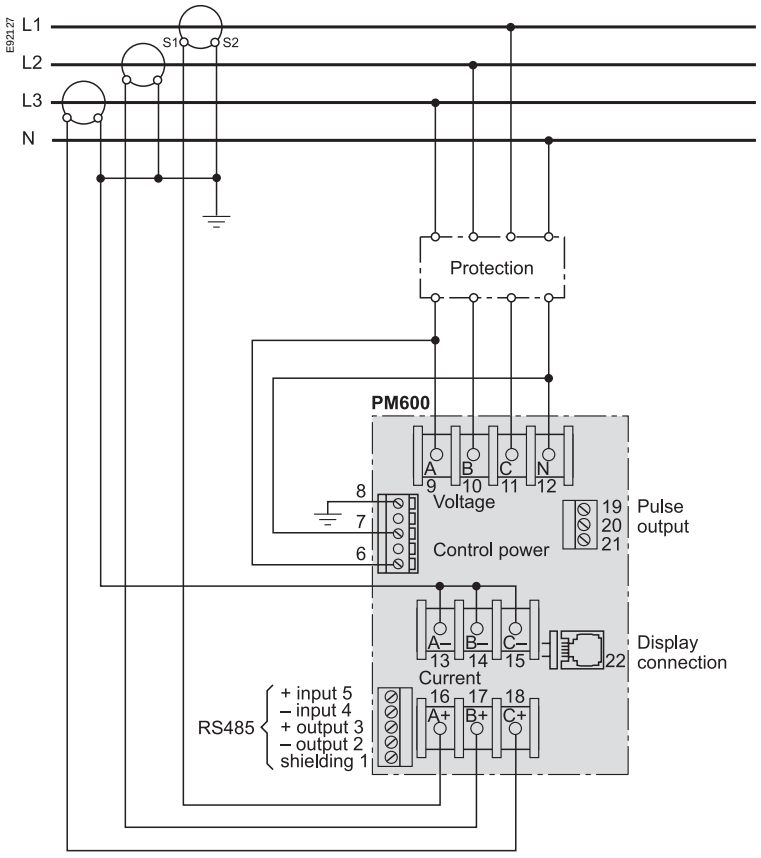




Front-panel mounting

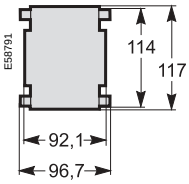


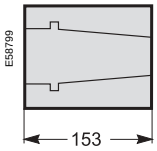
4-wire connection with 3 CTs and no PT



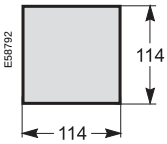
Power-monitoring unit (cont.)
Power Meter Series 600 (cont.)

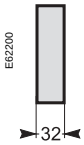
PM600 dimensions



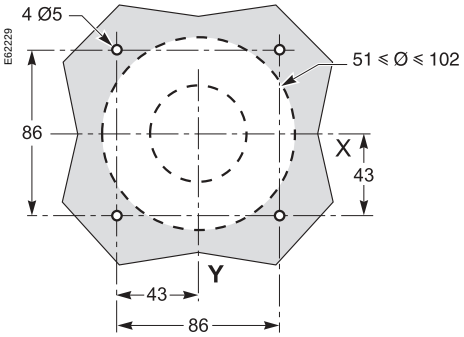


PM600 display dimensions



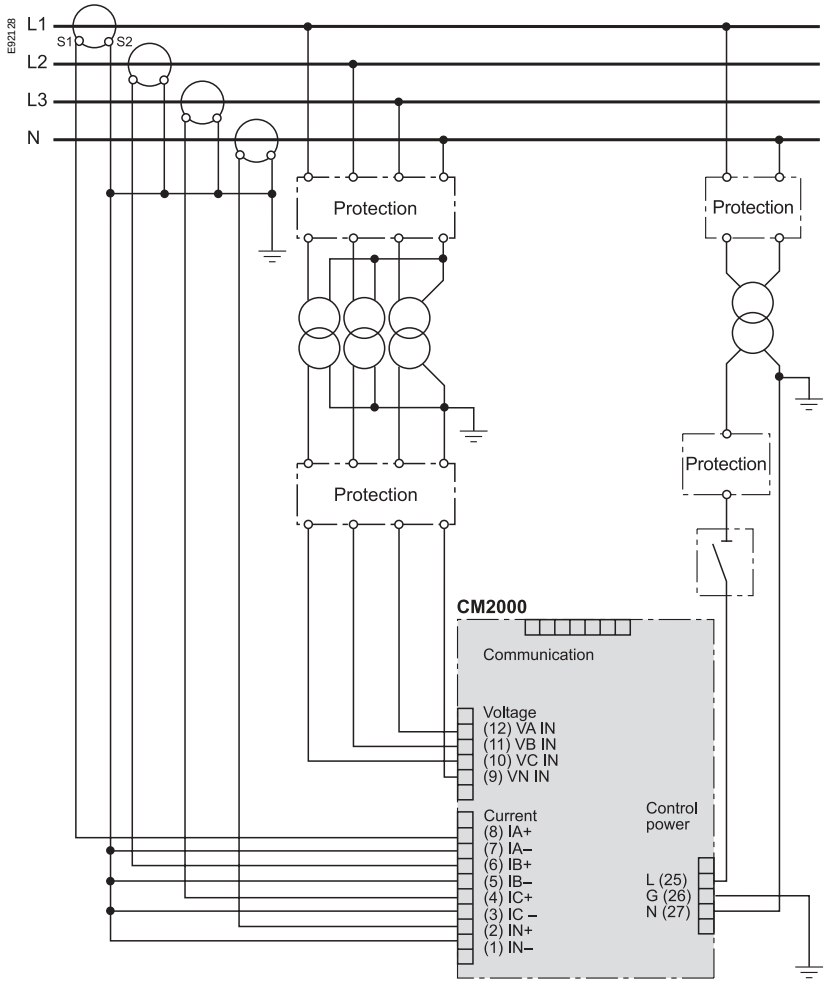


Mounting on a panel



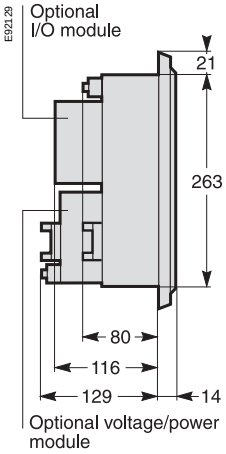
Power-monitoring unit (cont.)
Circuit Monitor Series 2000

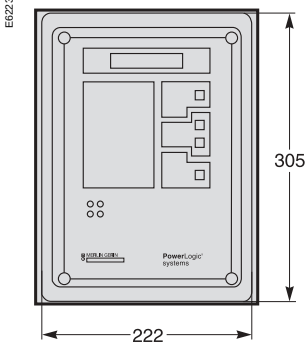
4-wire connection with 4 CTs and 3 PTs

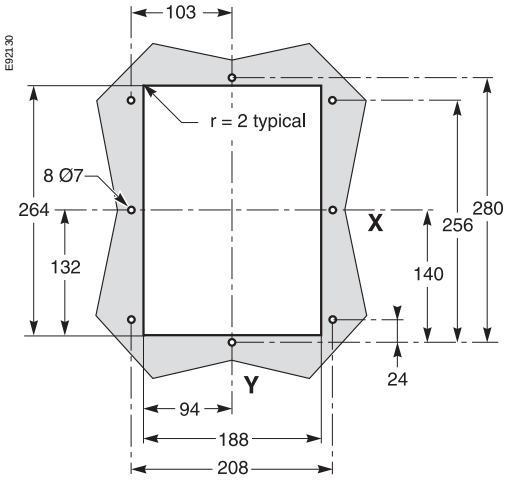


Power-monitoring unit (cont.)
Circuit Monitor Series 2000 (cont.)

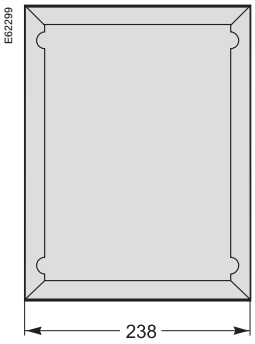
CM2000

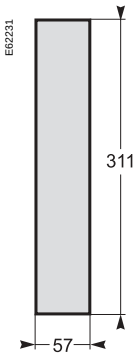


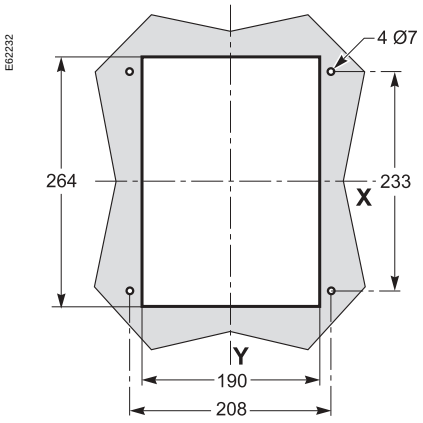




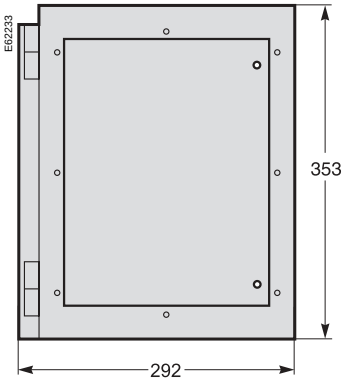
CMA100 adapter

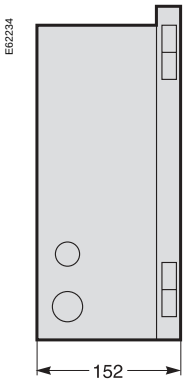


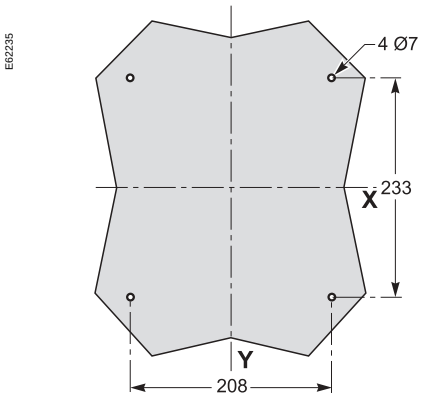




SMA220 surface-mount enclosure

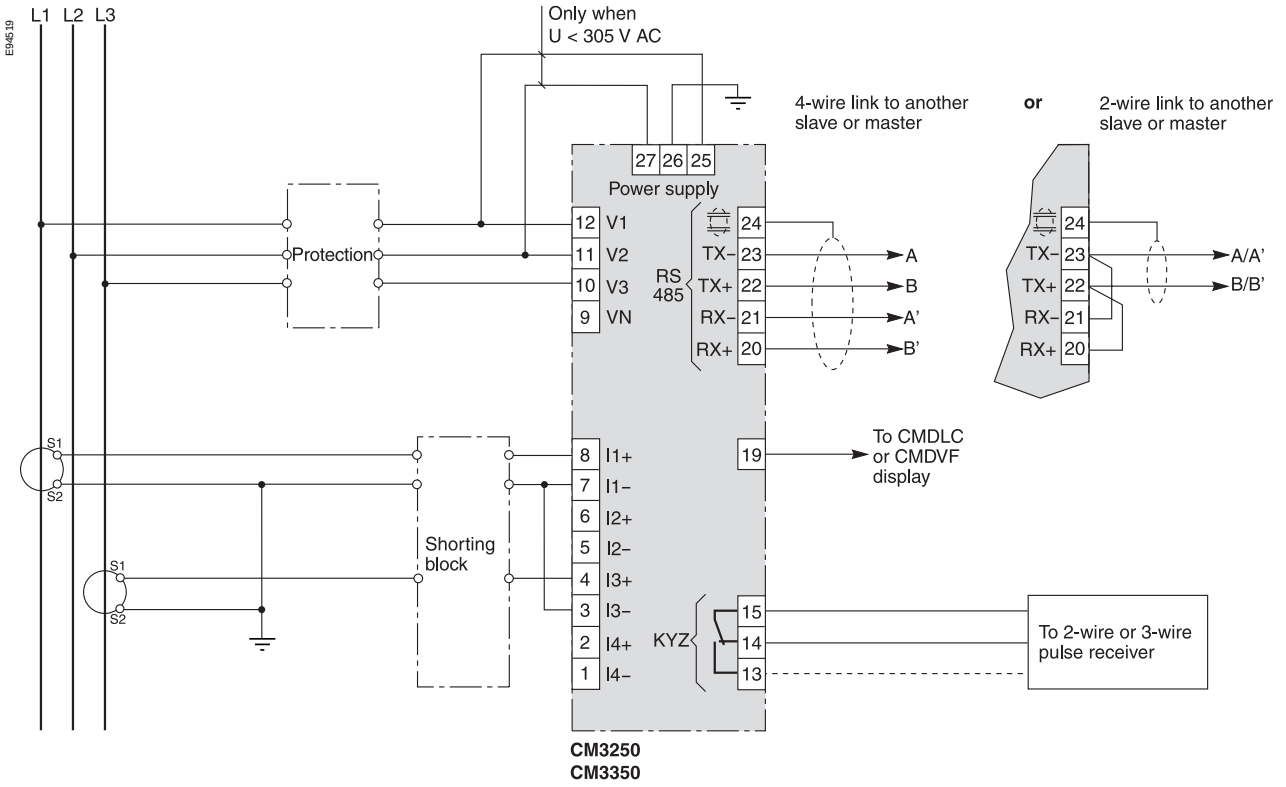




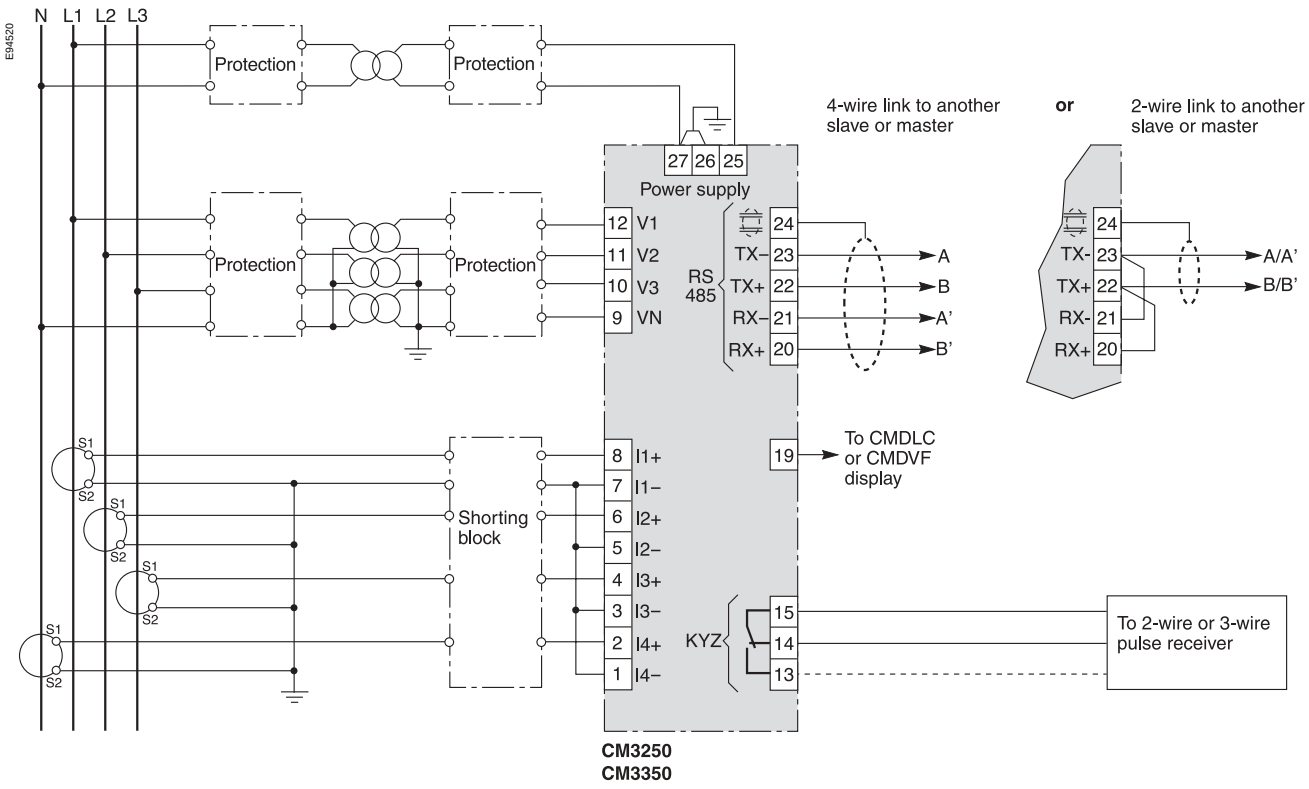


Circuit Monitor Series 3000
Installation and connection

3-wire connection with 2 CTs and no PT

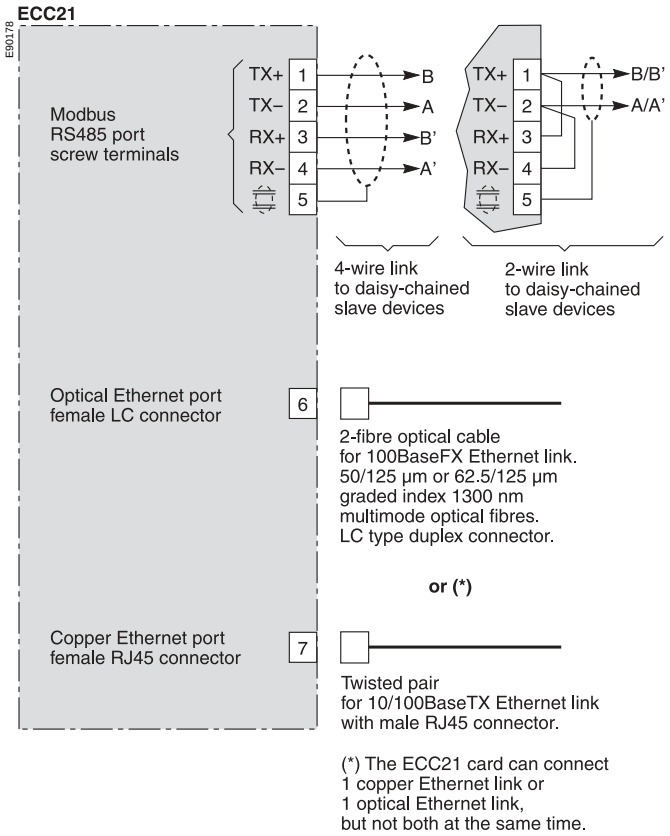


4-wire connection with 4 CTs and 3PTs

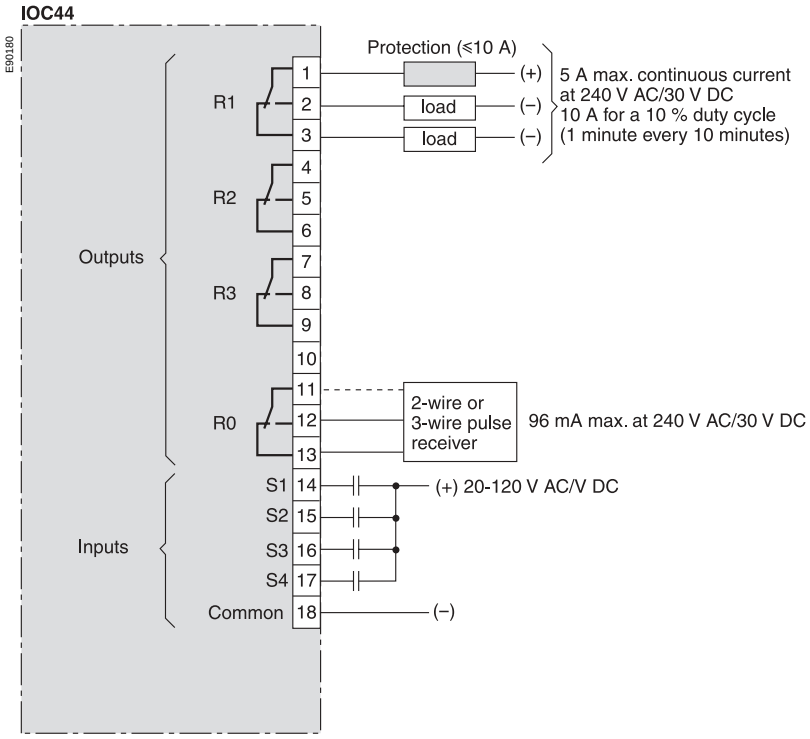


Circuit Monitor Series 3000
Installation and connection (cont.)

Ethernet ECC21 communication card

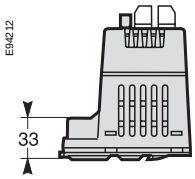


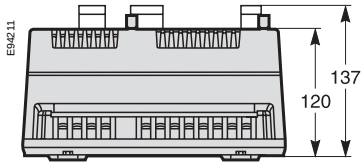
IOC44 input/output card

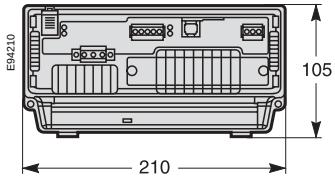


Circuit Monitor Series 3000
Installation and connection (cont.)

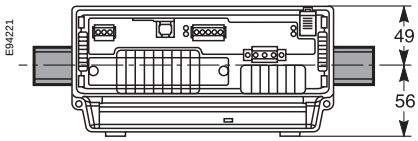
Dimensions

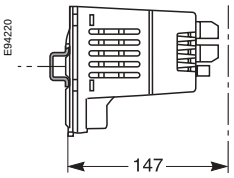




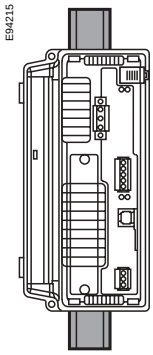


Mounting on DIN rail

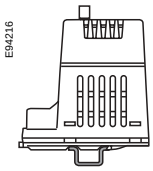


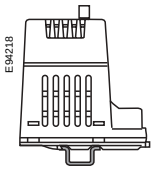


Mounting possibilities

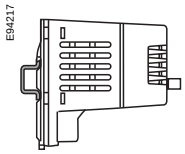


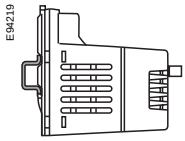
Vertical mounting.





Horizontal mounting.

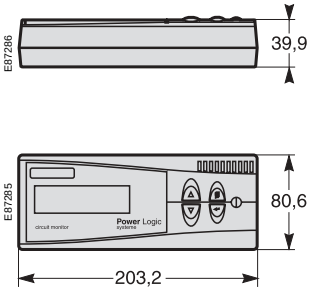




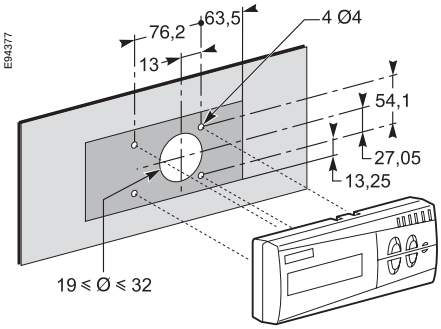
Vertical mounting.

Circuit Monitor Series 3000
Installation and connection (cont.)

CMDLC/CMDVF dimensions

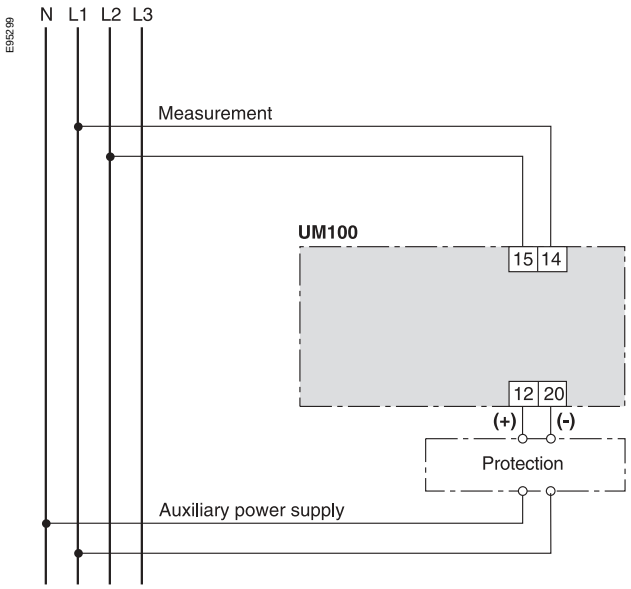


Mounting on a backplate

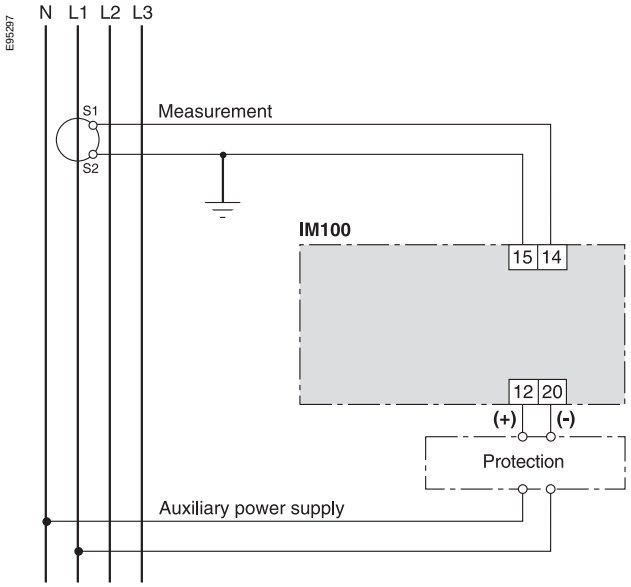


UM100 voltmeter
IM100 ammeter
Installation and connection

UM100 connection

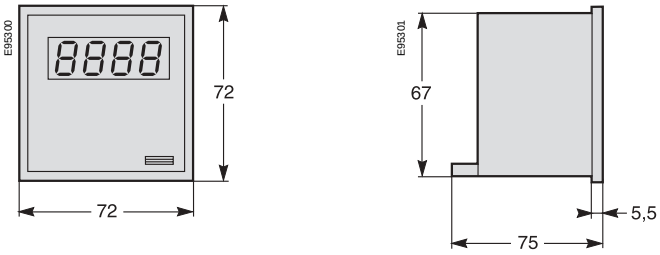


IM100 connection

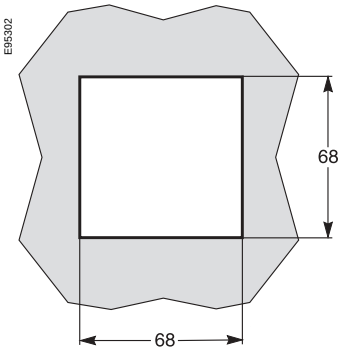


UM100 voltmeter
IM100 ammeter
Installation and connection (cont.)

UM100/IM100 dimensions

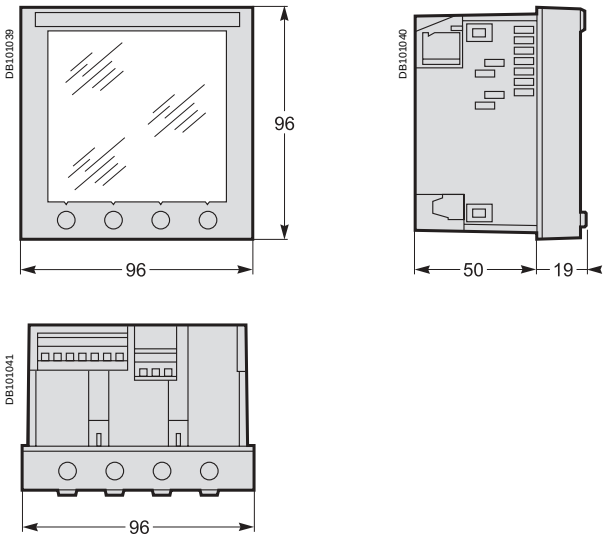


Front-panel mounting

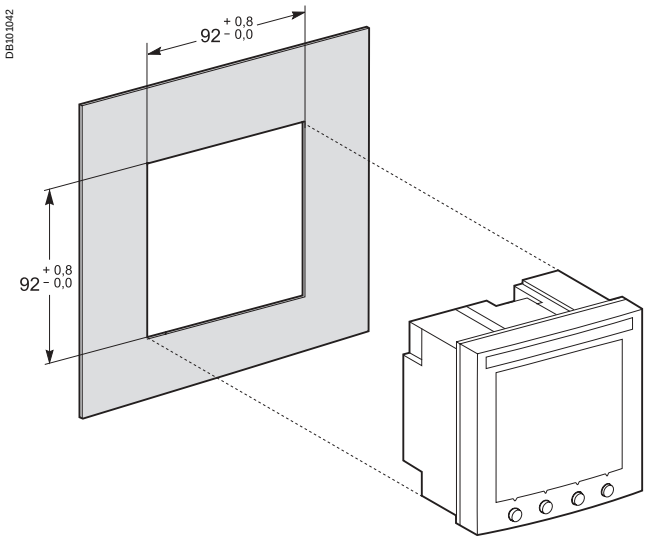


Power Meter Series 700
Installation and connection

Dimensions

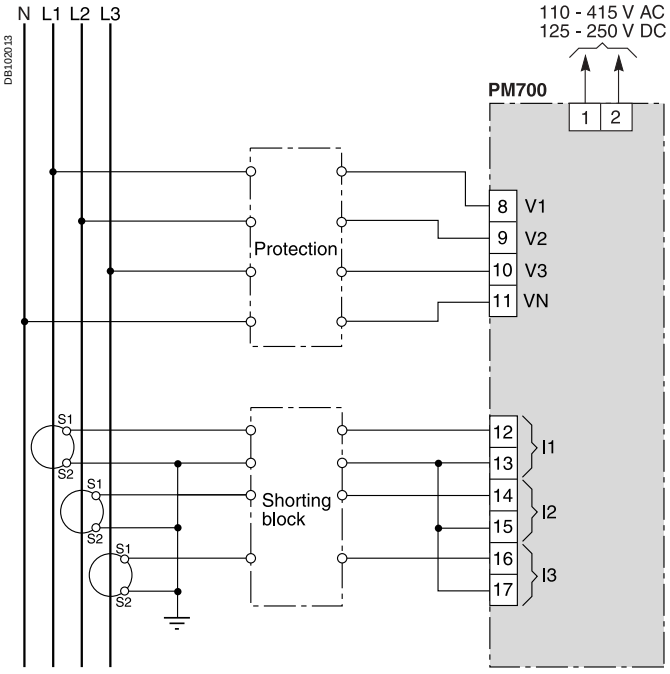


Front-panel mounting



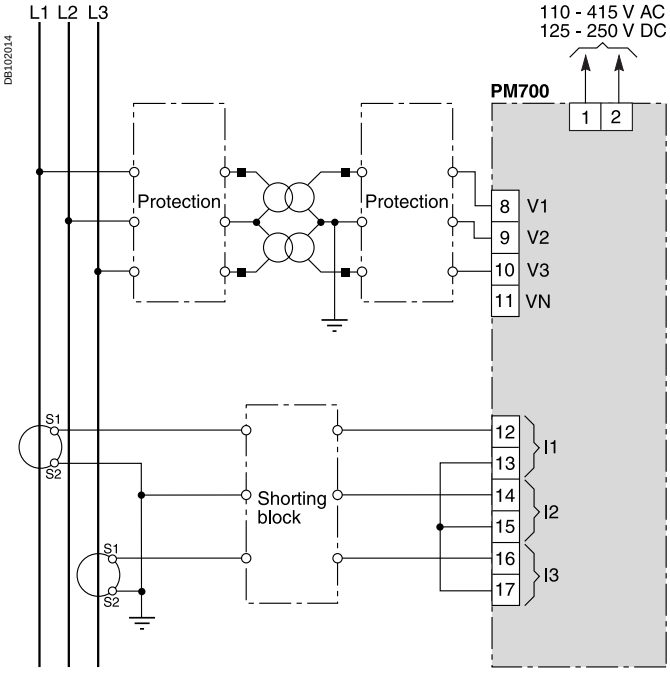
Power Meter Series 700
Installation and connection (cont.)

4-wire connection with 3 CTs and no PT



Connection example.

3-wire connection with 2 CTs and 2 PTs

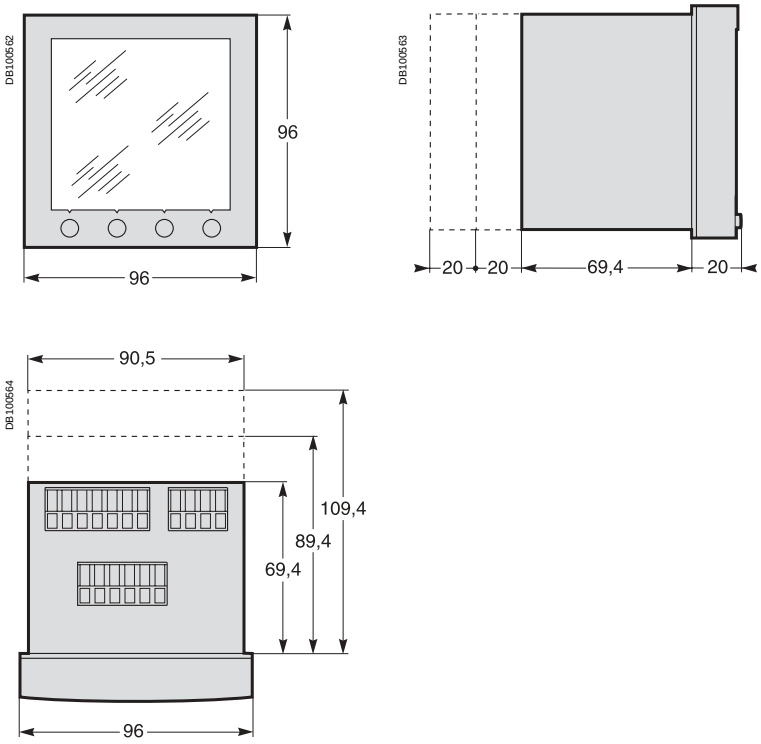


Connection example.

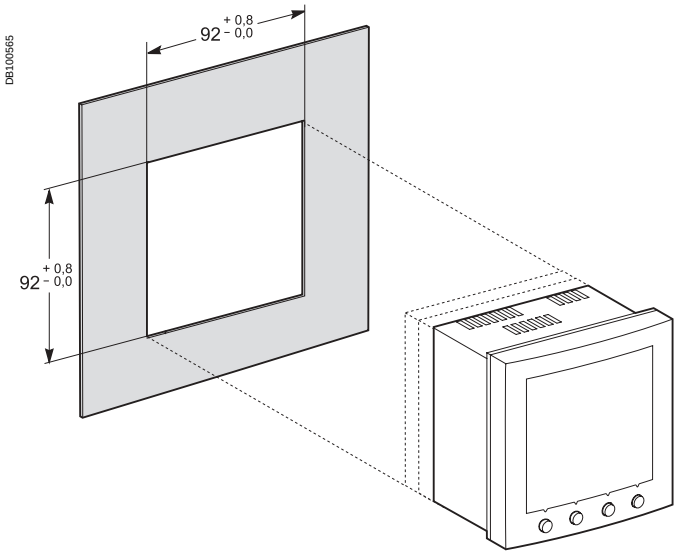
Note: *Other types of connection are possible. See product documentation.*

Power Meter Series 800
Installation and connection

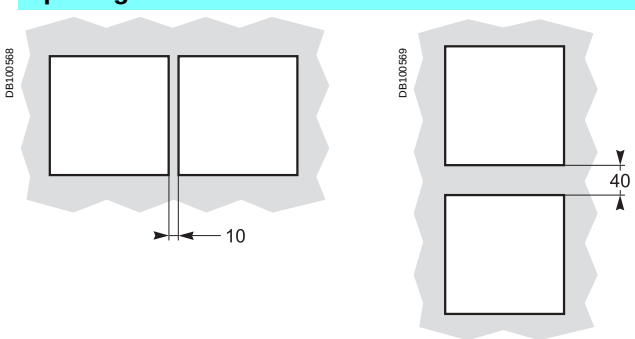
Dimensions



Front-panel mounting

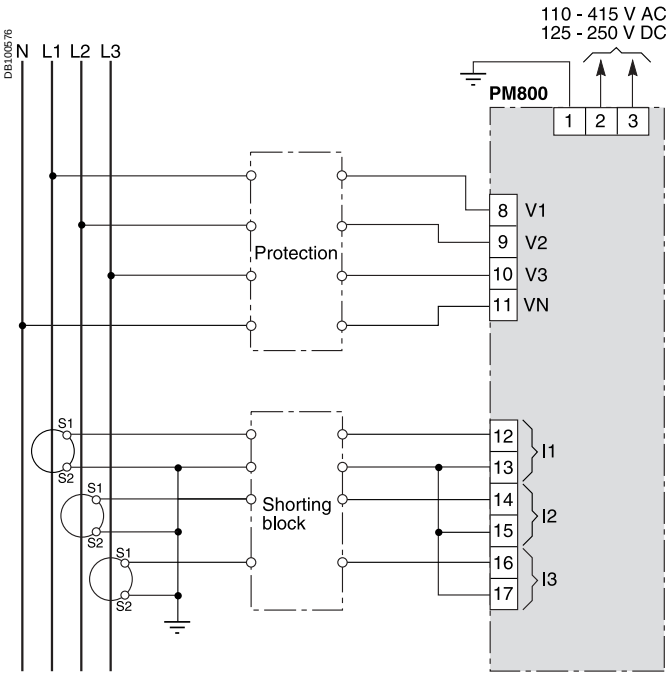


Spacing between units



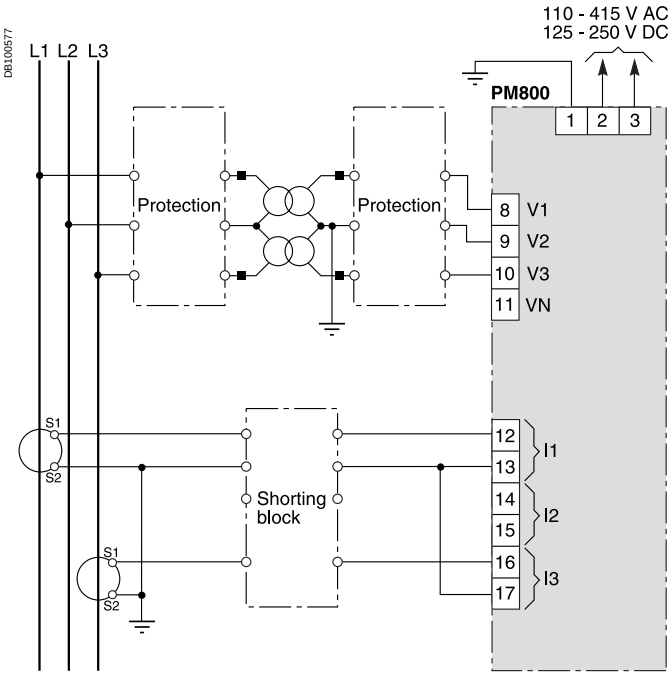
Power Meter Series 800
Installation and connection (cont.)

4-wire connection with 3 CTs and no PT



Connection example.

3-wire connection with 2 CTs and 2 PTs

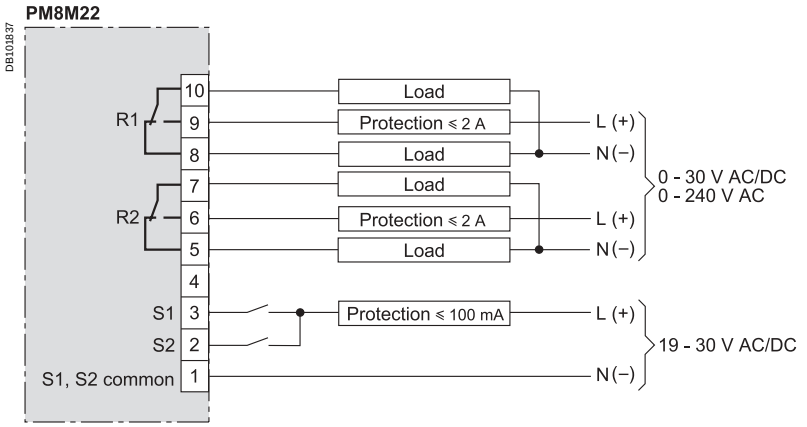


Connection example.

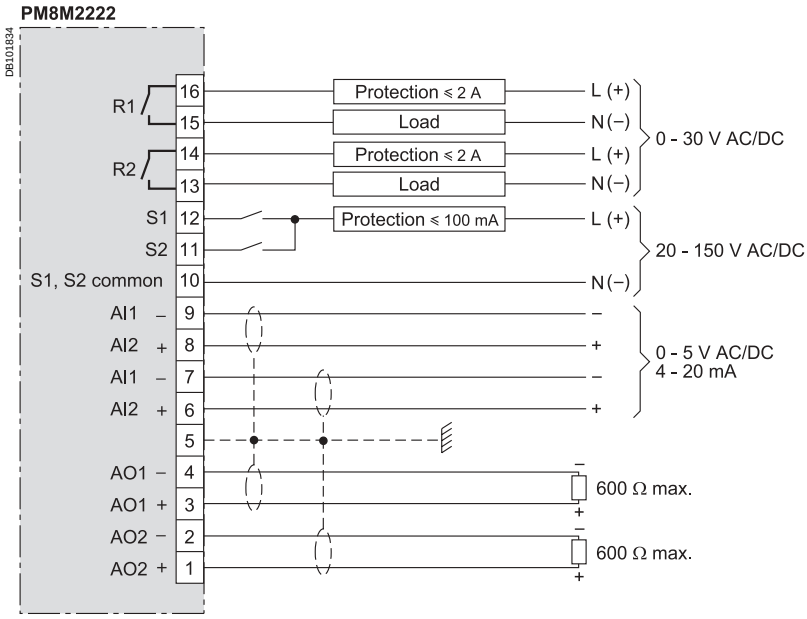
Note: *Other types of connection are possible. See product documentation.*

Power Meter Series 800
Installation and connection (cont.)

PM8M22 module

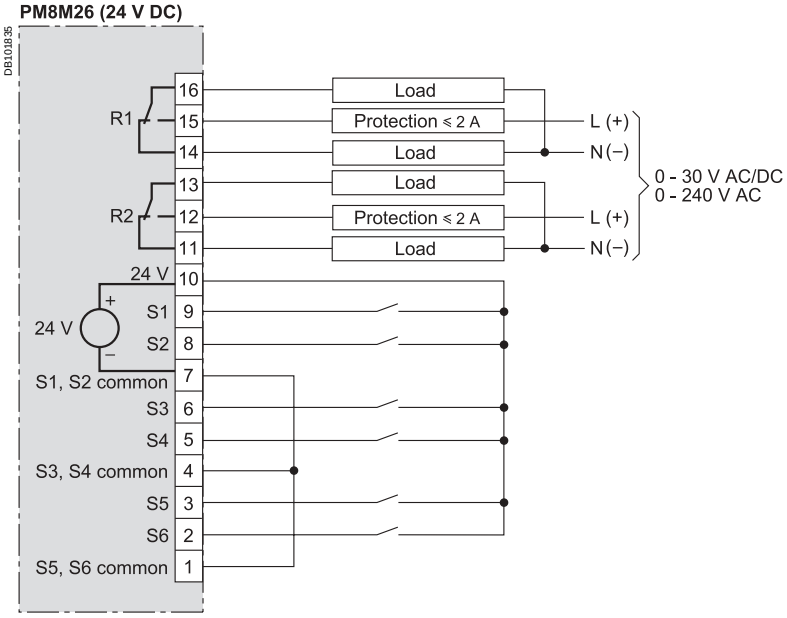


PM8M2222 module

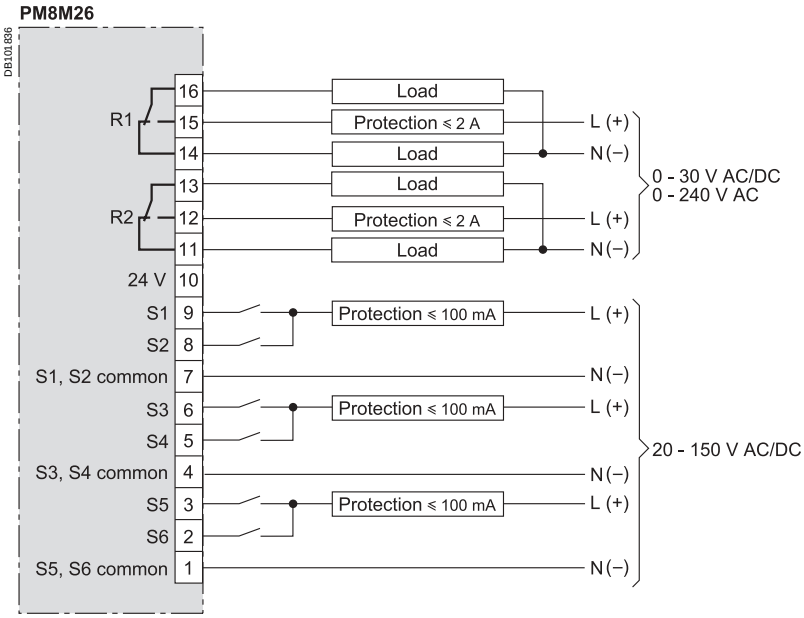


Power Meter Series 800
Installation and connection (cont.)

PM8M26 module internal 24 V DC power supply

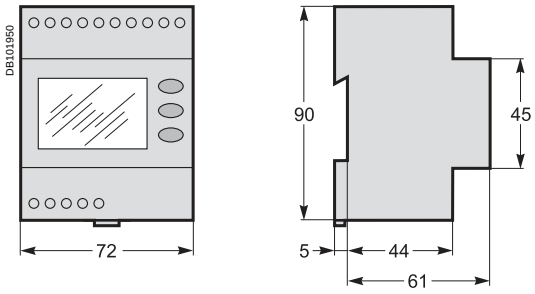


PM8M26 module external power supply



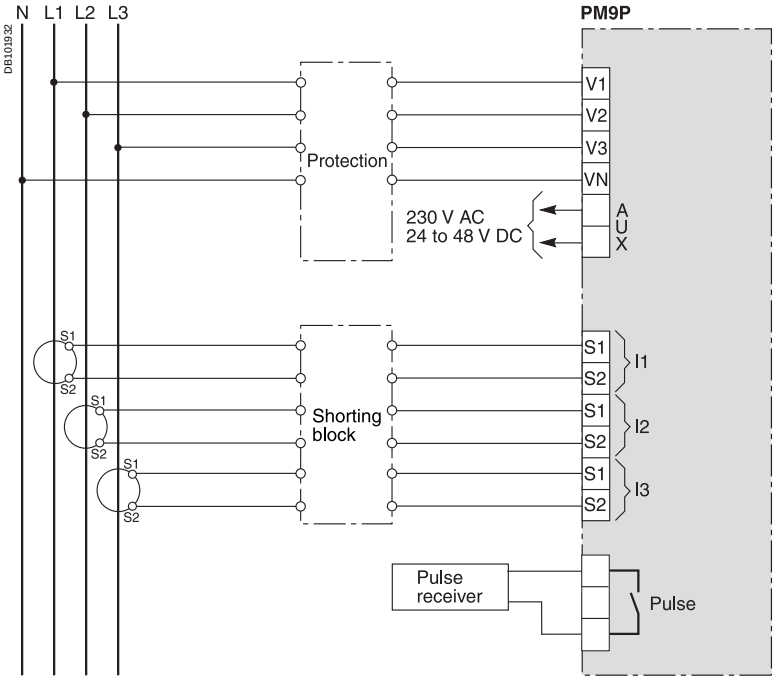
Power Meter Series PM9
Installation and connection

PM9P and PM9C dimensions



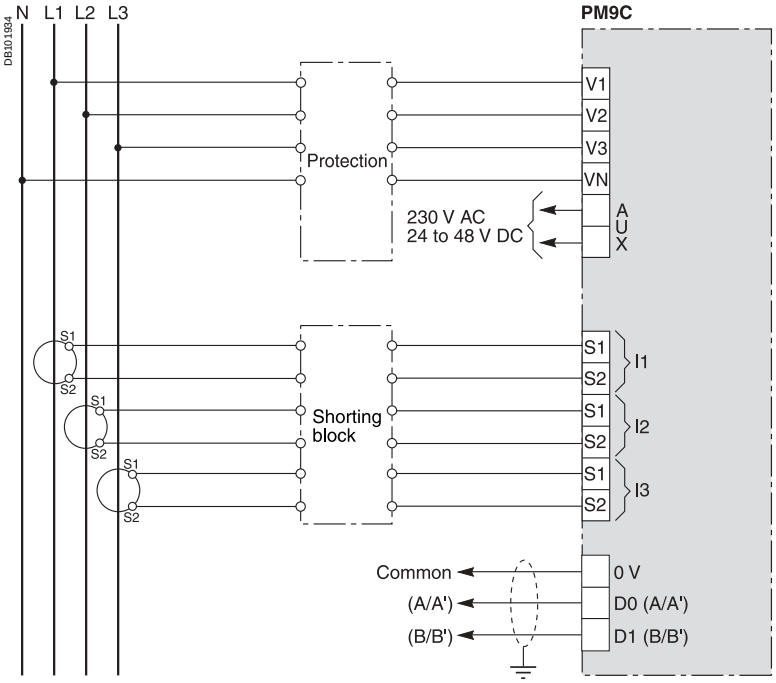
Power Meter Series PM9
Installation and connection (cont.)

PM9P/4-wire connection with 3 CTs



Connection example.

PM9C/4-wire connection with 3 CTs

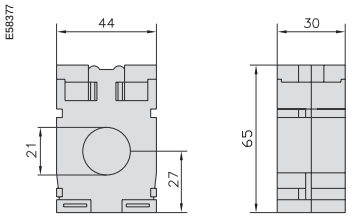


Connection example.

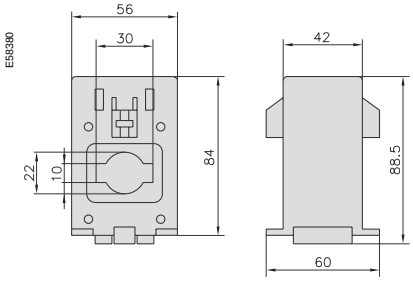
***Note:** other types of connection are possible. See product documentation.*

Dimensions

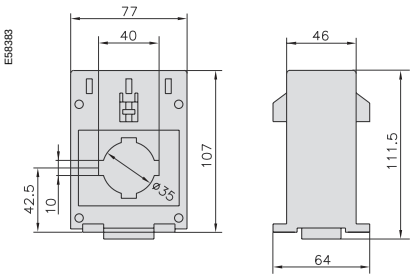
TI current transformers



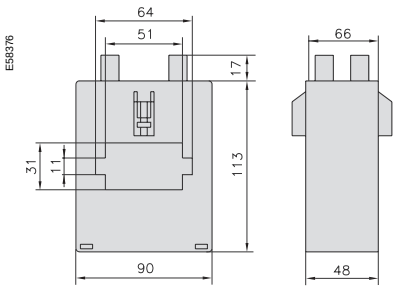
Cat. no. 16500 to 16506, 16451 to 16456



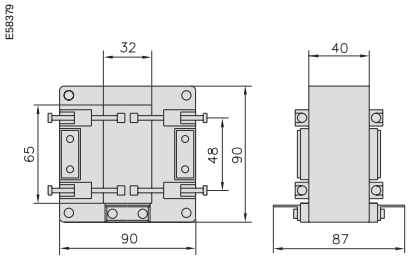
Cat. no. 16509 to 16515, 16459 to 16465



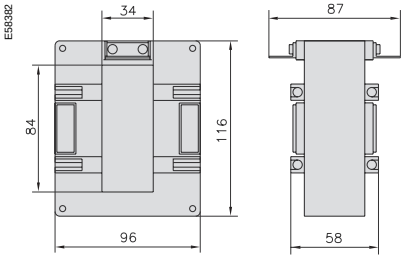
Cat. no. 16518 to 16521, 16468 to 16471



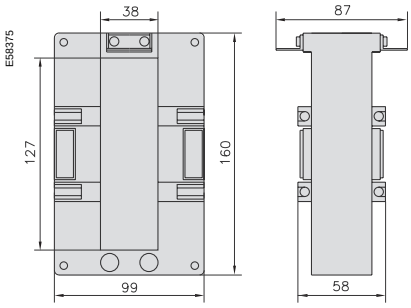
Cat. no. 16523 and 16524, 16473 and 16474



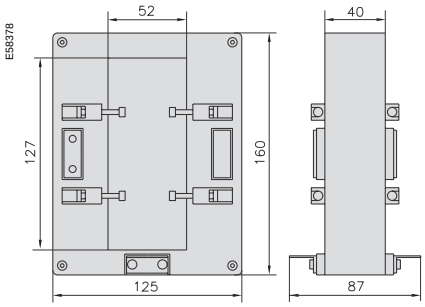
Cat. no. 16526 to 16535, 16476 to 16483



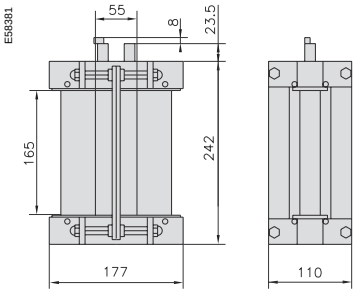
Cat. no. 16537 and 16538



Cat. no. 16540 to 16544

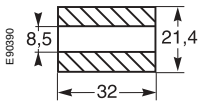


Cat. no. 16545 to 16547

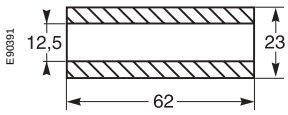


Cat. no. 16548 and 16549

Cylinders



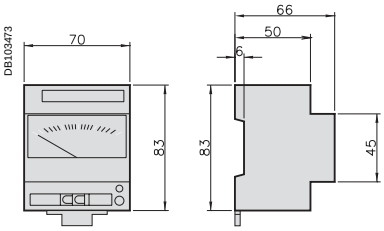
Cat. no. 16550



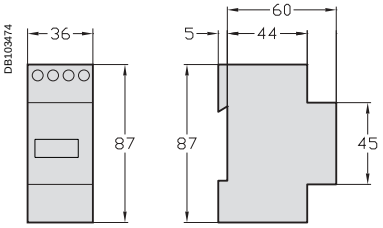
Cat. no. 16551

Dimensions

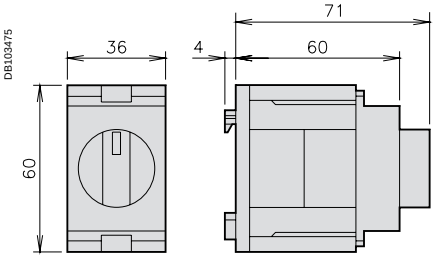
Analog ammeters and voltmeters



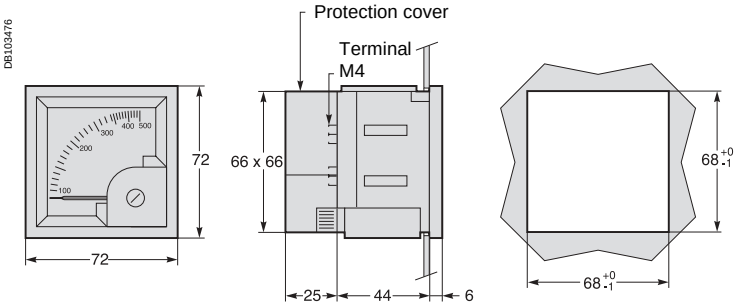
Digital ammeters, voltmeter and frequency meter



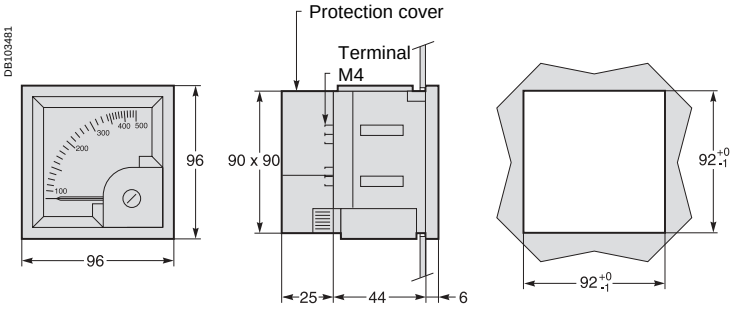
DIN rail CMA and CMV selector switches



72 x 72 analog ammeters and voltmeter

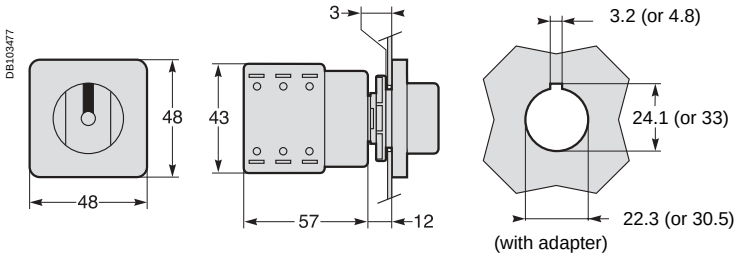


96 x 96 analog ammeters and voltmeter

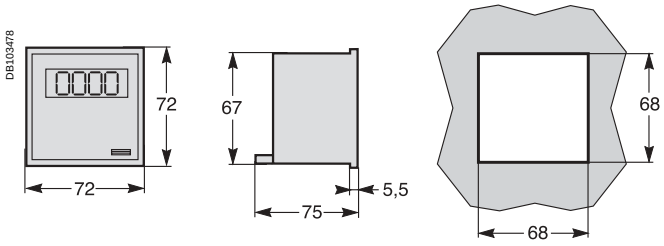


Dimensions (cont.)

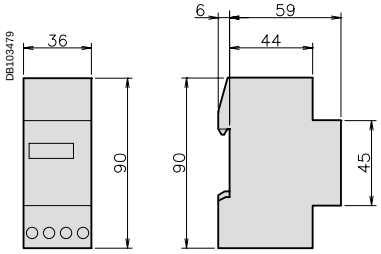
48 x 48 CMA and CMV selector switches



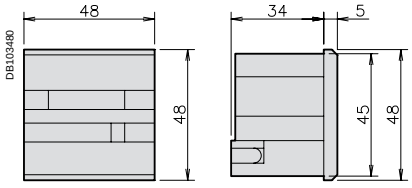
UM100 voltmeter, IM100 ammeter



CI impulse counter and CH hour counter

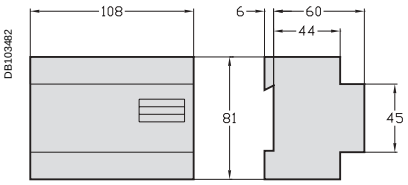


48 x 48 CH hour counters

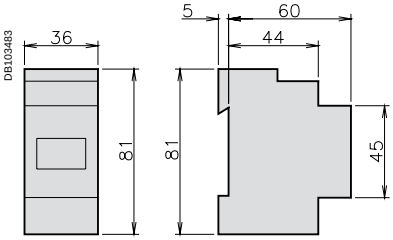


Dimensions

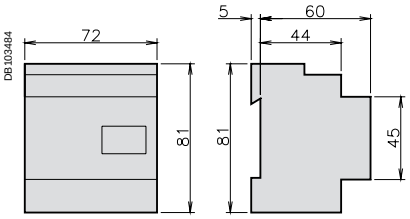
CE and CEr kilowatt hour meters



ME1, ME1z and ME1zr watt hour meters



ME3, ME3zr, ME4, ME4zr, ME4zrt watt hour meters



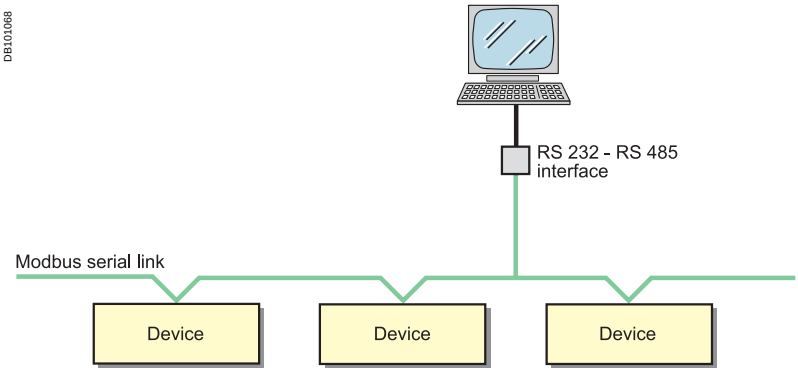
Communication interfaces and associated services

Switchboard-data acquisition and monitoring make it possible to anticipate events. In this way, they reduce customer costs in terms of operation, maintenance and investment.

Serial link

With communication technology, it is no longer necessary to be physically present on the site to access information. Data is transmitted by networks.
In all architectures, the communication interface serves as the link between the installation devices and the PC running the operating software. It provides the physical link and protocol adaptation.
Adaptation is required because the communication systems used by the PC (Modbus via RS 232 and/or Ethernet) are generally not those used by the installation devices (e.g. the Modbus protocol via RS 485).

Dedicated application software prepares the information for analysis under the best possible conditions.



Modbus communication architecture.

Communication interfaces and associated services (cont.)

E90463

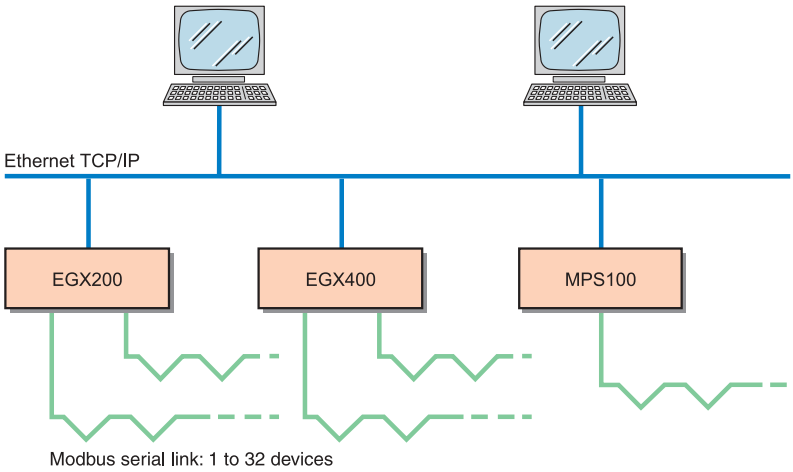
Transparent Ready

Ethernet link

Using modern Web technologies, the operator can access information from any PC connected to the network, with all the required security.

The Ethernet EGX200 gateway or the EGX400 and MPS100 servers provide adaptation between Modbus-RS 485 and Modbus-Ethernet TCP/IP **(1)**.

DB101069



Ethernet communication architecture.

The services available with these technologies considerably simplify the creation, maintenance and operation of these supervision systems.
The application software is now standardised. It is personalised by simply identifying the components in your installation and can be used as easily as any internet application.

These services are part of the Transparent Ready Equipment offer.
The first step in this approach is the EGX400 server with HTML pages set up by the WPG Web-page generator.
The SMS software, running on the PC, covers broader or more specific needs.

(1) *The ECC21 card, an auxiliary for the CM3000 and CM4000 Circuit Monitors, also serves as an interface between Modbus-RS 485 and Modbus-Ethernet TCP/IP.*

Ethernet EGX200 gateway

E90463

PB100707_68

PB100705_68

Function

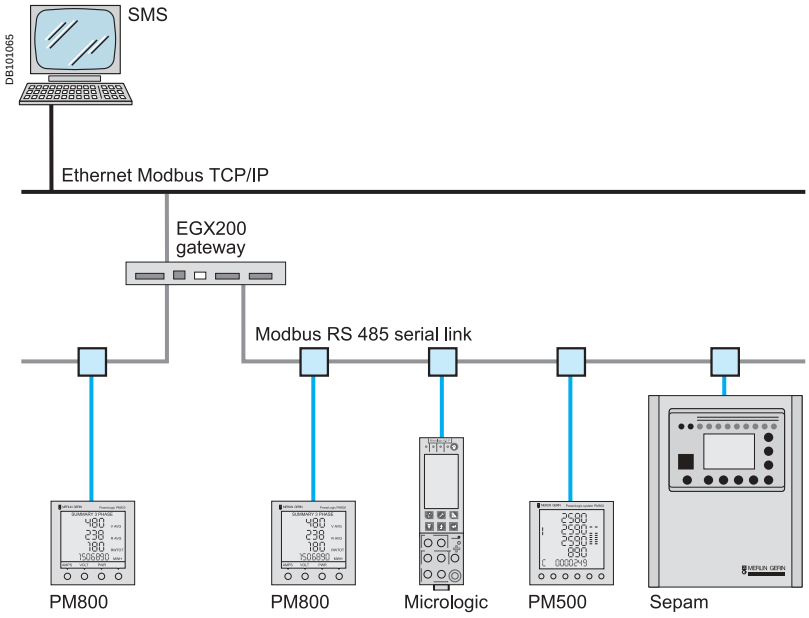
The EGX200 gateway serves as an Ethernet coupler for the PowerLogic System devices and for any other communicating devices operating under the Modbus RS 485 protocol.
The EGX200 gateway offers complete access to all status and measurement information provided by the connected devices, for example, via the SMS software installed on a PC.

SMS software

SMS power-monitoring software is recommended as a user interface because it provides access to all status and measurement information. It also prepares summary reports.

Architecture

DB101065



Setup

Initial setup

The initial setup is carried out using a PC connected to the EGX200 via an RS 232 link. This setup:

- specifies the IP address of the EGX gateway
- lists the connected products with their Modbus communication parameters.

Setup via the Ethernet network

Once connected to the Ethernet network, the EGX200 gateway can be accessed by a standard internet browser via its IP address to:

- create or update the list of the connected products with their Modbus communication parameters
- update the firmware.

Part number

Merlin Gerin brand	
EGX200	**EGX200MG**
Square D brand	
EGX200	**EGX200**

Ethernet EGX400 server

E90463

PB100704_68

PB100706_68

Function

The EGX400 server is used as an Ethernet coupler for the PowerLogic System devices and for any other communicating devices operating under the Modbus RS 485 protocol.
It contains HTML pages (set up using WPG) that can be accessed using a standard internet browser. The HTML pages are used to display the information provided by the devices connected to the server.

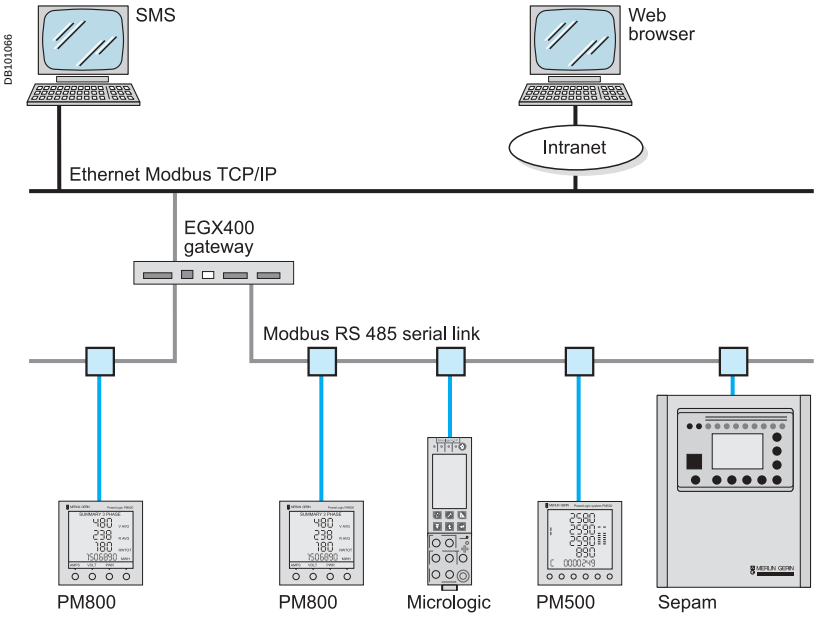
SMS software and internet browser

The EGX400 server makes it possible to implement two types of user interface:
- SMS power-monitoring software providing access to all status and measurement information. It also prepares summary reports
- a standard internet browser providing access to the main information organised in predefined HTML pages.

These two approaches, SMS and internet browser, are complementary:
- SMS offers complete access to all information, but must be installed on each PC
- the HTML pages offer partial access to the main information via any PC connected to the network.

Architecture

DB101066



Setup

Initial setup

The initial setup is carried out using a PC connected to the EGX400 via an RS232 link. This setup:
- specifies the IP address of the EGX gateway
- selects the type of Ethernet port (wire or optic fiber)
- lists the connected products with their Modbus communication parameters.

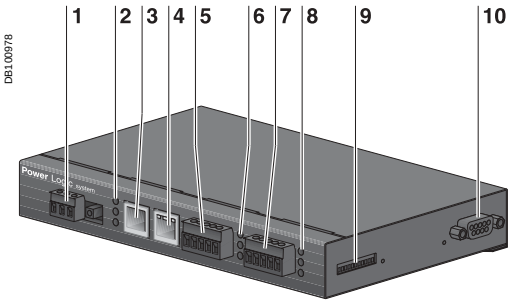
Setup via the Ethernet network

Once connected to the Ethernet network, the EGX400 server can be accessed by a standard internet browser via its IP address to:
- create or update the list of the connected products with their Modbus communication parameters
- update the firmware.

Part number

Merlin Gerin brand	
EGX400	**EGX400MG**
Square D brand	
EGX400	**EGX400**

Ethernet EGX200 gateway
Ethernet EGX400 server



1 *Power connector.*
2 *Ethernet indication LEDs.*
3 *10/100 Base TX port for connection to Ethernet via an RJ45 connector.*
4 *100 Base FX port for connection to Ethernet via an optic fiber (EGX400 only).*
5 *COM1: terminal block for RS 485 serial link.*
6 *COM1 indication LEDs.*
7 *COM2: terminal block for RS 485 serial link.*
8 *COM2 indication LEDs.*
9 *Mini-switches for setup of COM1 and COM2 ports.*
10 *COM2: Sub D-9 connector for connection to the RS 232 serial link.*

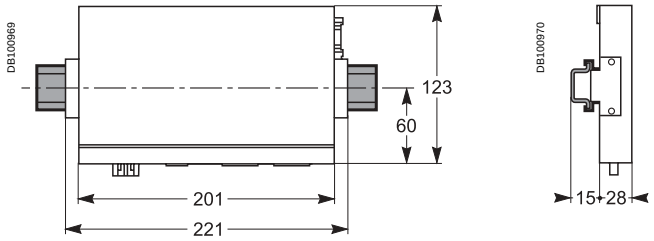
Characteristics

	EGX200 and EGX400	
Weight	700 g	
Dimensions (H x W x D)	25 x 190 x 115 mm	
Mounting	Symmetrical or asymmetrical DIN rail Front or side position	
Power supply	24 V DC 100-240 V AC/24 V DC adapter supplied	
Operating temperature	-30 °C to +80°C	
Humidity rating	5 % to 95 % relative humidity (without condensation) at +40 °C	
Compliance with standards		
Immunity in industrial environments	EN 61000-6-2 EN 61000-4-2/3/4/5/8/11 EN 55022/FCC class A UL508 cUL (complying with CSA C22-2 no. 14-M91)	
Serial ports		
Number of ports	2	
Types of ports	COM1: RS 485 (2-wire or 4-wire) COM2: RS 232 or RS 485 (2-wire or 4-wire), depending on settings	
Protocol	Modbus	
Baud rate	38400 bauds	
Maximum number of directly connected devices	32 per port, 64 in all	
Ethernet port	**EGX200**	**EGX400**
Number of ports	1	2
Types of ports	One 10/100 base TX port	One 10/100 base TX port One 100 base FX port (multimode optic fiber)
Protocol	Modbus/TCP	Modbus/TCP
Baud rate	10/100 MB	10/100 MB
Web server		
Memory for custom HTML pages	None	16 MB

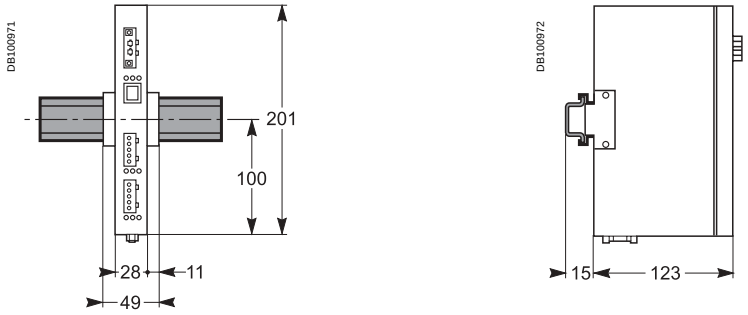
Ethernet EGX200 gateway
Ethernet EGX400 server (cont.)

Installation

Side mounting on DIN rail

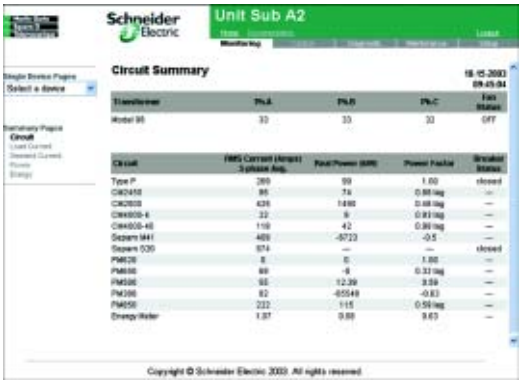


Front mounting on DIN rail



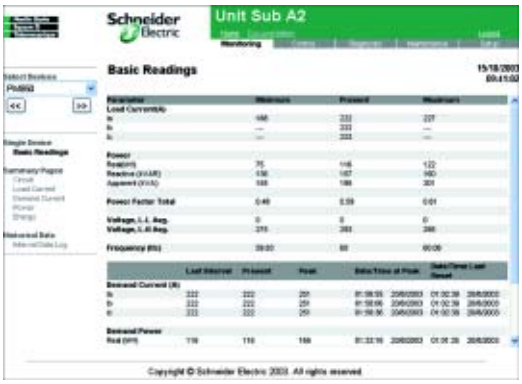
WPG software tool
HTML-page generator

DB101034



HTML page with summary information on all the equipment in a switchboard.

DB101035



Single device operating information HTML page.

DB101036

Single device HTML page showing historical data.

Function

Very easy to use, the WPG software tool generates HTML pages for the EGX400 server. It is used to:
- select the devices connected to the server
- transfer the HTML pages corresponding to the selected devices to the server.

The WPG tool can set up HTML pages for the following devices:
- Sepam Series 20, Sepam Series 40, Sepam Series 80 and Sepam 2000
- Masterpact equipped with Micrologic A, P and H control units
- Power Meter PM500, PM700 and PM800
- Circuit Monitor Series 2000, 3000 and 4000.

The WPG tool is PC software that can be used in three languages, French, Spanish and English.
To obtain WPG, contact your Schneider Electric representative.

HTML pages

Following transfer, the EGX400 contains HTML pages that can be used to remotely monitor equipment under secure conditions.
- 1st service level based on the summary pages.
- 2nd service level based on specific pages for each type of device.

Summary pages

Five summary pages are available for overall monitoring of the switchboard. They present the main measurements recorded by the devices connected to the server.
- Page 1
  - 3-phase average rms current
  - active power
  - power factor
- Page 2
  - rms current per phase
- Page 3
  - demand current per phase
- Page 4
  - demand power
  - peak power
  - time-stamping data
- Page 5
  - active power
  - reactive power
  - date and time of last reset of energy meters.

Specific pages for each device

A number of specific pages present detailed information on each device for in-depth analysis, e.g.:
- operating information:
  - instantaneous current per phase
  - demand current per phase
  - active and reactive power
  - average voltage (phase-to-neutral and phase-to-phase)
  - maximum unbalance
  - power factor
  - frequency
- event information:
  - minimum and maximum current values
  - maximum demand current
  - date and time of last reset
- historical data:
  - recording over 38 days of three user-selectable parameters (energy by default), every 15, 30 or 60 minutes, with graphic display and data export to an Excel file.

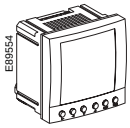
Digital Voltmeter UM100 (Merlin Gerin brand)

Supply voltage	48-115 V AC/DC	**50831**
	220-240 V AC	**50832**
	380-415 V AC	**50834**

Digital Ammeter IM100 (Merlin Gerin brand)

Supply voltage	48-115 V AC/DC	**50835**
	220-240 V AC	**50836**
	380-415 V AC	**50837**

Power Meter Series 500 (Merlin Gerin brand)



LV and MV application - 0.5% accuracy

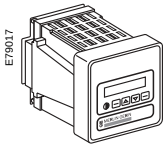
PM500	Basic instrumentation + THD + dmd, no communications	110-400 V AC/ 120-350 V DC	**50980**
PM500	Basic instrumentation + THD + dmd, no communications	24-48 V AC	**50981**

PM500 options

RS485 Modbus Module	RS485 communication option	**50982**
IO11 Puls Module	1 synchro, 1 pulse output	**50983**
IO22 Alarm Module	2 digital inputs, 2 relay outputs, alarm function, min/max	**50984**
A020 4-20 mA Module	2 x 4-20 mA analog outputs	**50985**

Power Meter Series 600 (Merlin Gerin/Square D brand)

Merlin Gerin brand



LV and MV application - 0.25% accuracy

PM600	Basic instrumentation, Modbus	90-600 V AC/ 100-300 V DC	**3020PM600MG**
PM620	Basic instrumentation + THD + dmd, Modbus	90-600 V AC/ 100-300 V DC	**3020PM620MG**
PM650	Basic instrumentation + THD + dmd, alarms and data logging, Modbus	90-600 V AC/ 100-300 V DC	**3020PM650MG**
PMD32	Power Meter Display + 0.3 m cable		**3020PMD32MG**

Square D brand

LV and MV application-0.25% accuracy

PM600	Basic instrumentation, Modbus	90-600 V AC/ 100-300 V DC	**3020PM600**
PM620	Basic instrumentation + THD + dmd, Modbus	90-600 V AC/ 100-300 V DC	**3020PM620**
PM650	Basic instrumentation + THD + dmd, alarms and data logging, Modbus	90-600 V AC/ 100-300 V DC	**3020PM650**
PMD32	Power Meter Display + 0.3 m cable		**3020PMD32**

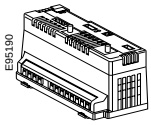
PM600 accessories

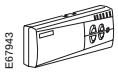
SC101	Serial Cable for Power Meter to Display, 0.3 m	**3020SC101**
SC104	Serial Cable for Power Meter to Display, 1.3 m	**3020SC104**
SC112	Serial Cable for Power Meter to Display, 4 m	**3020SC112**
SC130	Serial Cable for Power Meter to Display, 10 m	**3020SC130**

Power-monitoring units (cont.)

Circuit Monitor Series 3000 (Merlin Gerin/Square D brand)

Merlin Gerin brand





CM3250	Advanced inst.,On-board data logging, waveform capture, cl 0.5S	90-305 V AC/ 100-300 V DC	**CM3250MG**
CM3350	Same as CM3250 + disturbance recording	90-305 V AC/ 100-300 V DC	**CM3350MG**
CMDLC	4-line x 20 character liquid crystal display with backlighting, includes CAB12		**CMDLCMG**
CMDVF	4-line x 20 character Vacuum fluorescent display, includes CAB12		**CMDVFMG**

Square D brand

CM3250	Advanced inst.,On-board data logging, waveform capture, cl 0.5S	90-305 V AC/ 100-300 V DC	**CM3250**
CM3350	Same as CM3250 + disturbance recording	90-305 V AC/ 100-300 V DC	**CM3350**
CMDLC	4-line x 20 character liquid crystal display with backlighting, includes CAB12		**CMDLC**
CMDVF	4-line x 20 character Vacuum fluorescent display, includes CAB12		**CMDVF**

CM3000 I/O options (Merlin Gerin/Square D brand)

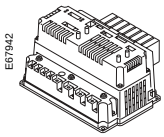
IOC44	Field installable I/O card, 4 status inputs, 3 relays outputs, 1 pulse output (KYZ)	**IOC44**

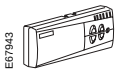
CM3000 accessories (Merlin Gerin/Square D brand)

ECC21	Ethernet comms card, 100 Mbps fiber and 10/100 Mbps UTP Ethernet port, 1 RS485 master port	**ECC21**
OCIVF	I/R com.Interface to the vacuum furescent display, includes CAB12	**OCIVF**
CAB4	1.3 m display cable	**CAB4**
CAB12	4.2 m display cable	**CAB12**
CAB30	9 m display cable	**CAB30**

Circuit Monitor Series 4000 (Merlin Gerin/Square D brand)

Merlin Gerin brand





CM4000	Advanced inst., 0.07% accuracy, On-board data logging, WFC, disturbance recording, 8 Mb	90-305 V AC/ 100-300 V DC	**CM4000MG**
CM4000XR	Same as CM4000 + current extended range	90-305 V AC/ 100-300 V DC	**CM4000XRMG**
CM4000T	Same as CM4000 + transient detection	90-305 V AC/ 100-300 V DC	**CM4000TMG**
CMDLC	4-line x 20 character liquid crystal display with backlighting, includes CAB12		**CMDLCMG**
CMDVF	4-line x 20 character Vacuum fluorescent display, includes CAB12		**CMDVFMG**

Square D brand

CM4000	Advanced inst., 0.07% accuracy, On-board data logging, WFC, disturbance recording, 8 Mb	90-305 V AC/ 100-300 V DC	**CM4000**
CM4000XR	Same as CM4000 + current extended range	90-305 V AC/ 100-300 V DC	**CM4000XR**
CM4000T	Same as CM4000 + transient detection	90-305 V AC/ 100-300 V DC	**CM4000T**
CMDLC	4-line x 20 character liquid crystal display with backlighting, includes CAB12		**CMDLC**
CMDVF	4-line x 20 character Vacuum fluorescent display, includes CAB12		**CMDVF**

CM4000 I/O options

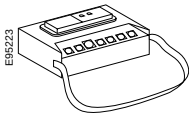
IOC44	Field installable I/O card, 4 status inputs, 3 relay outputs, 1 pulse output (KYZ)	**IOC44**
DI120AC	120 V AC input (1 input, for use with IOX)	**DI120AC**
DI240AC	240 V AC input (1 input, for use with IOX)	**DI240AC**
DI32DC	32 V DC input (0.2 ms turn on) polarised (1 input, for use with IOX)	**DI32DC**
DO120AC	120 V AC output (1 output, for use with IOX)	**DO120AC**
DO240AC	240 V AC output (1 output, for use with IOX)	**DO240AC**
DO60DC	60 V DC output (1 output, for use with IOX)	**DO60DC**
DO200DC	200 V DC output (1 output, for use with IOX)	**DO200DC**

Power-monitoring units (cont.)

CM4000 I/O options (cont.)			
	AI420	4 to 20 mA analog input (1 input, for use with IOX)	**AI420**
	AI05	0 to 5 V DC analog input (1 input, for use with IOX)	**AI05**
	AO420	4 to 20 mA analog output (1 output, for use with IOX)	**AO420**
	IOX0404	I/O Extender Module with 4 status inputs, 4 analog outputs (4-20 mA)	**IOX0404**
	IOX2411	I/O Extender Module with 2 120 V digital outputs, 4 DC status inputs, 1 analog output, 1 analog input	**IOX2411**
	IOX08	I/O Extender Module with 8 status inputs (120 V AC)	**IOX08**
	IOX	I/O Extender Module only, no installed I/O, accepts up to 8 I/O modules with maximum of 4 analog I/0	**IOX**
CM4000 accessories			
	ECC21	Ethernet comms Card, 100 Mbps fiber and 10/100 Mbps UTP Ethernet port, 1 RS485 master port	**ECC21**
	CVM	Current/Voltage module	**CVM**
	CVMXR	Current/Voltage module with current extended range	**CVMXR**
	CVMT	Current/Voltage module with high speed voltage transient detection	**CVMT**
	OCIVF	I/R communications Interface to the vacuum fluorescent display, includes CAB12	**OCIVF**
	CM4MEM16M	16 MB memory expansion kit	**CM4MEM16M**
	CM4MEM32M	32 MB memory expansion kit	**CM4MEM32M**
	CM4MA	Mounting kit to mount CM4000 and display back to back	**CM4MA**
	CAB4	1.3 m display cable	**CAB4**
	CAB12	4.2 m display cable	**CAB12**
	CAB30	9 m display cable	**CAB30**

Portable Circuit Monitor Series 4000 (Merlin Gerin/Square D brand)

Merlin Gerin brand



	PCM4000	Portable CM4000 with CMDVF display, cable set, bag and Ride Through Module	**PCM4000MG**
	PCM4000T	Same as CM4000 + transient detection	**PCM4000TMG**

Square D brand

	PCM4000	Portable CM4000 with CMDVF display, cable set, bag and Ride Through Module	**PCM4000**
	PCM4000T	Same as CM4000 + transient detection	**PCM4000T**
Portable CM4000 options			
	PHTA	High temperature adaptation (70°), needs PIOC44	**PHTA**
	PECC21	Factory installed ECC21	**PECC21**
	PIOC44	Factory installed IOC44	**PIOC44**
	PCM4MEM16M	Factory installed 16MB memory upgrade	**PCM4MEM16M**
	PCM4MEM32M	Factory installed 32MB memory upgrade	**PCM4MEM32M**
	PCM4EUCORD	Control power cord / European type	**PCM4EUCORD**
	PCM4UKCORD	Control power cord / UK type	**PCM4UKCORD**
	PLESNS36005	Current clamp-on 5 A CT 150/300/500 A (each)	**PLESNS36005**
	PLESH163155	Current clamp-on 5 A CT 500/1000/1500 A (each)	**PLESH163155**
	PLESHP32335	Current clamp-on 5 A CT 1000/2000/3000 A (each)	**PLESHP32335**

Supervision Software

Software

E62305

SMS121	System Manager Software: single device communication software	**SMS121ENG**
		SMS121FRA
		SMS121ESP
PMX1500	Power Monitoring Explorer: multiple device supervisory software, stand alone	**PMX1500ENG**
		PMX1500FRA
		PMX1500ESP
SMS1500	Power Monitoring Explorer: multiple device supervisory software, advanced features, stand alone	**SMS1500ENG**
		SMS1500FRA
		SMS1500ESP
SMS3000	System Manager Software: client/server supervisory software, advanced features	**SMS3000ENG**
		SMS3000FRA
		SMS3000ESP
SMS1000	System Manager Software: client supervisory software, advanced features	**SMS1000ENG**
		SMS1000FRA
		SMS1000ESP
GFX1000	SMS and PMX graphics add-on module English	**GFX1000ENG**
		GFX1000FRA
		GFX1000ESP

Software upgrade

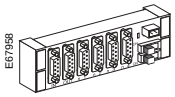
SMS121 U	Upgrade from latest version	**SMS121UENG**
		SMS121UFRA
		SMS121UESP
PMX1500 U	Upgrade from latest version	**PMX1500UENG**
		PMX1500UFRA
		PMX1500UESP
SMS1500 U	Upgrade from latest version	**SMS1500UENG**
		SMS1500UFRA
		SMS1500UESP
SMS3000 U	Upgrade from latest version	**SMS3000UENG**
		SMS3000UFRA
		SMS3000UESP
SMS1000 U	Upgrade from latest version	**SMS1000UENG**
		SMS1000UFRA
		SMS1000UESP
GFX1000 U	Upgrade from latest version	**GFX1000UENG**
		GFX1000UFRA
		GFX1000UESP
SMS121 U KIT	Upgrade from previous version	**SMS121UKITENG**
		SMS121UKITFRA
		SMS121UKITESP
PMX1500 U KIT	Upgrade from previous version	**PMX1500UKITENG**
		PMX1500UKITFRA
		PMX1500UKITESP
SMS1500 U KIT	Upgrade from previous version	**SMS1500UKITENG**
		SMS1500UKITFRA
		SMS1500UKITESP
SMS3000 U KIT	Upgrade from previous version	**SMS3000UKITENG**
		SMS3000UKITFRA
		SMS3000UKITESP
SMS1000 U KIT	Upgrade from previous version	**SMS1000UKITENG**
		SMS1000UKITFRA
		SMS1000UKITESP
GFX1000 U KIT	Upgrade from previous version	**GFX1000UKITENG**
		GFX1000UKITFRA
		GFX1000UKITESP

Ethernet gateways and Power servers

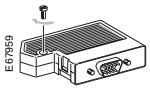
Ethernet gateways and Power servers (Merlin Gerin/Square D brand)			
	EGX200	Ethernet Gateway, double port	**EGX200MG** (Merlin Gerin brand)
			EGX200
	ECC21	Please refer to CM3000/4000 accessories list	
	EGX400	Ethernet Gateway, double port + Web server	**EGX400MG** (Merlin Gerin brand)
			EGX400
	MPS100	Micro Power Server with automatic notification	**33507**
	PWRSRV750	Power Server with embedded user interfaces	**PWRSRV750MG** (Merlin Gerin brand)
			PWRSRV750
PWRSRV750 accessory			
	SD700	Local display for Power Server	**SD700MG** (Merlin Gerin brand)
			SD700
	PS080	24V DC/50 W (2.1 A) DIN-mountable Power supply	**PS080**
EGX accessory			
	EGWNMC	Null modem cable for use with Ethernet gateway	**3050EGWNMC**

Communication Interfaces and Accessories

Modbus pre-wired system

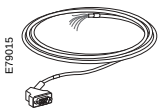


CJB306	6 SubD 9 pin connector junction block		**50963**



CSD309	9 pin SubD connector with screw terminals		**50964**

Cables



CCP303	Masterpact or Compact pre-wired cable (4 RS485 wires + 2 power wires)	3 m	**50961**
CCS303	Pre-wired cable (4 RS485 wires)	3 m	**50962**

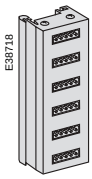
CCR301	RS485 roll cable (2 RS485 wires + 2 power wires)	60 m roll	**50965**
MCA485	Multi-point Communications Adapter, RS485		**3090MCA485**
MCT485	Multi-point Communications Terminator, RS485, spade lug type		**3090MCT485**
MCTAS485	Multi-point Communications Terminator, RS485, for Phoenix screw terminals		**3090MCTAS485**

Converter

ACE909-2	RS485/RS232 converter (2 wires)		**50786**

Digipact Bus pre-wired system

Junction block



Junction block for Digipact internal Bus			**50778**

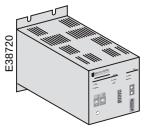
Cables

Cable for Digipact internal Bus	20-meter roll (0.75 mm^2)		**50779**
	100-meter roll (0.75 mm^2)		**50780**

LV installation Control and Monitoring (Digipact Merlin Gerin)

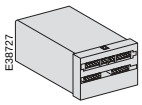
Interfaces and auxiliaries

Data concentrator DC150


E38720

Supply voltage	110-240 V AC/115-125 V DC	**50823**

Indication and control interface SC150


E38727

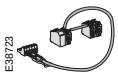
Powered by the DC150 module	**50784**

Indication and local control module CLS150

E38719

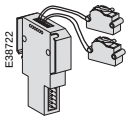
Powered by the DC150 module	**50785**

Communicating auxiliary switches for Compact NS circuit breakers


E38723

OF, SD and SDE communicating auxiliary switches for Compact NS100/160/250 (the SDE adapter for thermal-magnetic trip units is included)	**29453***
OF, SD and SDE communicating auxiliary switches for Compact NS400/630	**32551***

Communicating "connected/disconnected" position indication switches for Compact NS circuit breakers


E38722

CE/CD "Connected/disconnected" communicating auxiliary switches for Compact NS100/630	**29296***

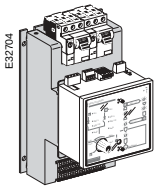
Motor mechanism + communicating auxiliary swithes for Compact NS circuit breakers

E18610

E38724

MT100/160	220-240 V AC + communicating OF, SD, SDE for Compact NS100/160	**29441***
MT250	220-240 V AC + communicating OF, SD, SDE for Compact NS250	**31549***
MT400	220-240 V AC + communicating OF, SD, SDE for Compact NS400	**32652***
MT630	220-240 V AC + communicating OF, SD, SDE for Compact NS630	**32848***

Source-changeover control


E32704

Automatic source-changeover system		
ACP + controller UA150	220-240 V AC, 50/60 Hz	**29474***
Comprising:	Auxiliary control plate ACP	**29363***
	Controller UA150	**29379***
ACP + controller UA150	380-415 V AC, 50/60 Hz and 440 V AC, 60 Hz	**29475***
Comprising:	Auxiliary control plate ACP	**29364***
	Controller UA150	**29381***

* See Compact price list

Schneider Electric Industries SAS
89, boulevard Franklin Roosevelt
F - 92500 Rueil-Malmaison (France)
Tel : +33 (0)1 41 29 85 00

http://www.schneider-electric.com

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